SIEMENS

# Getting Started with HC15

Siemens Cellular Engine

Version: 02
DocId: HC15_startup_v02
Products: HC15

User's Guide

| | |
|---|---|
| User's Guide: | **Getting Started with HC15** |
| Version: | **02** |
| Date: | **2007-2-16** |
| DocId: | **HC15_startup_v02** |
| Status | **Confidential / Preliminary** |
| Supported Products: | **HC15** |

**General Notes**

Product is deemed accepted by recipient and is provided without interface to recipient's products. The documentation and/or product are provided for testing, evaluation, integration and information purposes. The documentation and/or product are provided on an "as is" basis only and may contain deficiencies or inadequacies. The documentation and/or product are provided without warranty of any kind, express or implied. To the maximum extent permitted by applicable law, Siemens further disclaims all warranties, including without limitation any implied warranties of merchantability, completeness, fitness for a particular purpose and non-infringement of third-party rights. The entire risk arising out of the use or performance of the product and documentation remains with recipient. This product is not intended for use in life support appliances, devices or systems where a malfunction of the product can reasonably be expected to result in personal injury. Applications incorporating the described product must be designed to be in accordance with the technical specifications provided in these guidelines. Failure to comply with any of the required procedures can result in malfunctions or serious discrepancies in results. Furthermore, all safety instructions regarding the use of mobile technical systems, including GSM products, which also apply to cellular phones must be followed. Siemens or its suppliers shall, regardless of any legal theory upon which the claim is based, not be liable for any consequential, incidental, direct, indirect, punitive or other damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information or data, or other pecuniary loss) arising out the use of or inability to use the documentation and/or product, even if Siemens has been advised of the possibility of such damages. The foregoing limitations of liability shall not apply in case of mandatory liability, e.g. under the German Product Liability Act, in case of intent, gross negligence, injury of life, body or health, or breach of a condition which goes to the root of the contract. However, claims for damages arising from a breach of a condition, which goes to the root of the contract, shall be limited to the foreseeable damage, which is intrinsic to the contract, unless caused by intent or gross negligence or based on liability for injury of life, body or health. The above provision does not imply a change on the burden of proof to the detriment of the recipient. Subject to change without notice at any time. The interpretation of this general note shall be governed and construed according to German law without reference to any other substantive law.

**Copyright**

Transmittal, reproduction, dissemination and/or editing of this document as well as utilization of its contents and communication thereof to others without express authorization are prohibited. Offenders will be held liable for payment of damages. All rights created by patent grant or registration of a utility model or design patent are reserved.

Copyright © Siemens AG 2007

**Trademark notice**

MS Windows® is a registered trademark of Microsoft Corporation.

# Contents

**1 Introduction ..... 4**
1.1 Related Documents ..... 4
1.2 Abbreviations ..... 5

**2 Installation and Configuration ..... 6**
2.1 Technical Requirements for Running HC15 on DSB75 ..... 6
2.2 Installing the Hardware ..... 7
2.3 Installing Connection Manager and Preparing Driver Installation ..... 9
2.4 Installing USB and Ethernet Drivers ..... 11
2.5 Special Installation Notes ..... 14
2.6 Installed Devices and Tools ..... 15
2.7 Uninstalling Drivers and Connection Manager ..... 16
2.8 Uninstalling Drivers and Tools from Earlier HC15 Releases ..... 17
2.8.1 Uninstalling Earlier Drivers ..... 17
2.8.2 Uninstalling Earlier Connection Manager ..... 17

**3 Using the HC15 Module ..... 18**
3.1 AT Command Interpreter ..... 18
3.2 Switching on the HC15 ..... 19
3.3 Switching off the HC15 ..... 19
3.4 Registering to the Network ..... 19
3.5 Selecting UMTS or GSM ..... 20
3.6 Attaching to the HSDPA or GPRS Network ..... 21
3.7 Defining the PDP Context ..... 21
3.8 Making a Voice Call (MO) ..... 22
3.9 Answering a Voice Call (MT) ..... 22
3.10 HSDPA or GPRS Data Transfer ..... 23
3.10.1 HSDPA or GPRS Data Transfer via Siemens Wireless Ethernet Adapter ..... 23
3.10.2 HSDPA or GPRS Data Transfer via Dial-Up Network ..... 24
3.10.2.1 Local Echo Settings ..... 25

**4 Appendix I ..... 26**
4.1 Adding and Configuring a New Dial-Up Connection ..... 26
4.1.1 Creating a New Dial-up Network Connection ..... 26
4.1.2 Configuring a Dial-up Network Connection ..... 29

**5 Appendix II ..... 32**
5.1 Configuring DSB75 Support Board and Adapter Board ..... 32

**6 Index ..... 36**

# 1 Introduction

HC15 is the first Siemens wireless module to offer UMTS and GSM capability on the same device. The benefit is that the HC15 includes HSDPA capability in a UMTS network and also all common mobile connectivity features like voice, short messages, GPRS and EGPRS.

The HC15 modules need to connect to an adequate host device, such as the Evaluation Board DSB75. Designed to help application manufacturers and system integrators to test and develop their HC15 host application, the DSB75 provides all interfaces and peripherals needed to run the HC15.

The purpose of this document is to guide you through the process of connecting the hardware, installing the software on a Windows XP system, and, last but not least, making the first data transmission via UMTS and HSDPA.

## 1.1 Related Documents

**Documents supplied with HC15**

**[1]** HC15 Hardware Interface Description
**[2]** HC15 AT Command Set
**[3]** HC15 Release Notes

**Other related documents**

**[4]** DSB75 Development Support Board Hardware Description
Designed for a wide range of Siemens wireless modules this document is ready for download on the Siemens Website: http://www.siemens.com/wm

## 1.2 Abbreviations

| Abbreviation | Description |
|---|---|
| APN | Access Point Name |
| CHAP | Challenge Handshake Authentication Protocol |
| GPRS | General Packet Radio Service |
| HSDPA | High-Speed Downlink Packet Access |
| IP | Internet Protocol |
| ME | Mobile Equipment |
| MO | Mobile Originated |
| MT | Mobile Terminated |
| PAP | Password Authentication Protocol |
| PDP context | Packet Data Protocol context |
| TA | Terminal Adapter |
| TE | Terminal Equipment |
| UICC | Universal Integrated Circuit Card |
| UMTS | Universal Mobile Telecommunication System |
| URC | Unsolicited Result Code |

# 2 Installation and Configuration

## 2.1 Technical Requirements for Running HC15 on DSB75

- Windows XP computer, minimum USB 1.1 connector
- HC15 module
- HC15 driver package
  Modules shipped from factory have the driver package available in the mass storage and are prepared for easy installation.
  Please follow the installation guidelines provided below: First connect the HC15 module to the DSB75 and start the computer (see Section 2.2). Then install the Siemens Connection Manager to prepare the driver installation (see Section 2.3). Finally install the drivers (see Section 2.4).
- Local Administrator Privileges on the particular Windows XP computer are required to install the Siemens Connection Manager.
- If drivers from earlier HC15 preview releases are still installed be sure to uninstall them first. See Section 2.8
- USB cable
- DSB75 Evaluation Board providing the application interface between the HC15 USB port and the computer's USB port.
- Adapter for mounting the HC15 module onto the DSB75
- 9 to 15 Volts power supply applied at the DSB75 for powering up the DSB75 and the connected HC15 module
- 1 mini antenna cable (50 Ohms) from the Hirose U.FL connector on the HC15 module to the Hirose U.FL on the DSB75; 1 external RF antenna connecting to the SMA connector of the DSB75 (product name: SMARTEQ MiniMag), both delivered with DSB75
- Metal plate for grounding the external RF antenna, min. 20 cm x 20 cm
- Optional: Handset, eg. Handset for Siemens products from Votronic delivered with DSB75
- Terminal program to control the USB port under Windows, for example Windows Hyperterminal
- UICC card
- Service provider settings for access to the GPRS and HSDPA services, as a rule the following:
  - APN (network operator specific Name of Access Point that connects the GSM network to the Internet)
  - Primary and secondary DNS
  - IP address (DHCP or static)
  - QoS settings
  - User name and password
- HC15 offers two ways to access the GPRS or HSDPA networks: either the Siemens Wireless Ethernet Adapter controlled by the Siemens Connection Manager or a dial-up network connection set up via the Siemens HSDPA USB Modem. For details see Section 3.10.
- Make sure to operate the HC15 always with the UICC card inserted in the DSB75 card reader and a valid SIM PIN entered. This is because most AT commands require SIM PIN authentication.

## 2.2 Installing the Hardware

To properly connect the HC15 module and all accessories to the DSB75 Support Board follow these steps:

- Check that all switches of the DSB75 Support Board are set as described in Chapter 5. See also Figure 4 which shows an exploded view of all parts.
- Connect the one end of the mini antenna cable to the Hirose U.FL connector located on the module's top side.
- Mount the HC15 module upside down onto the 50-pin board-to-board connector of the adapter board. Use the supplied M2 screws and nuts to screw the module to the adapter board.
- Attach the adapter board to the 80-pin header located on the DSB75. Take gentle care that all pins are aligned correctly, then press down evenly on the adapter board until it is firmly seated. Use the supplied M3 screw and bolt to secure the adapter board to the DSB75 Support Board.
- Connect the other end of the mini antenna cable to the the Hirose U.FL connector of the DSB75.
- Screw the external antenna (MiniMag) into the SMA connector on the DSB75. To improve the antenna performance use the metal plate for grounding. The external antenna should be positioned in the center of the metal plate.
- Connect the Western plug of the handset to the Western jack on the DSB75.
- Connect the power cables to the red (BATT+) and black (Ground) connectors of the DSB75.
- Plug the USB cable to the computer's USB port and to the USB port of the DSB75. Press the IGT key of the DSB75 to switch on the HC15 module. Start your Windows XP computer.
- See Section 2.3 to continue.

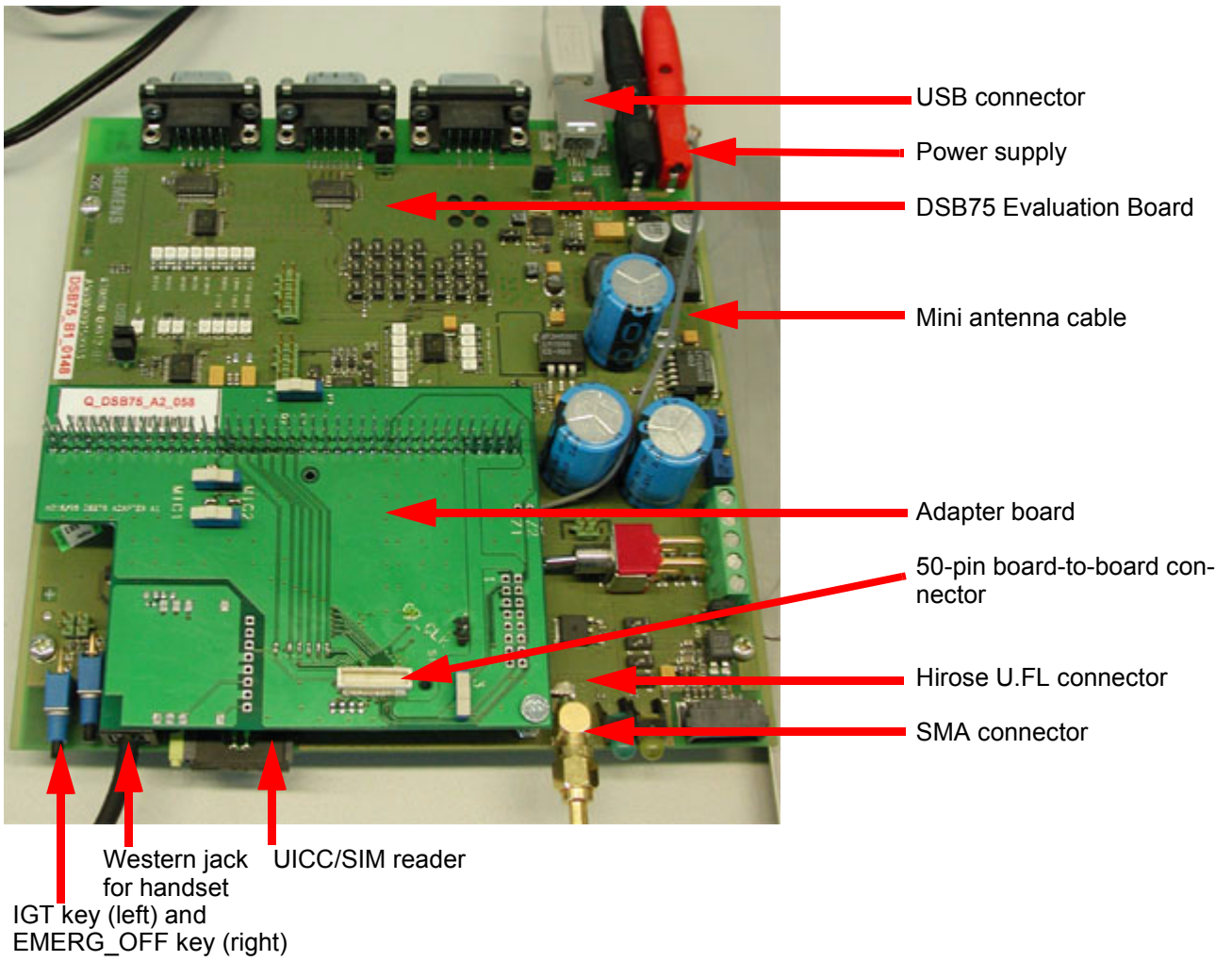



**Figure 1:** DSB75 with mounted adapter board and mini antenna cable

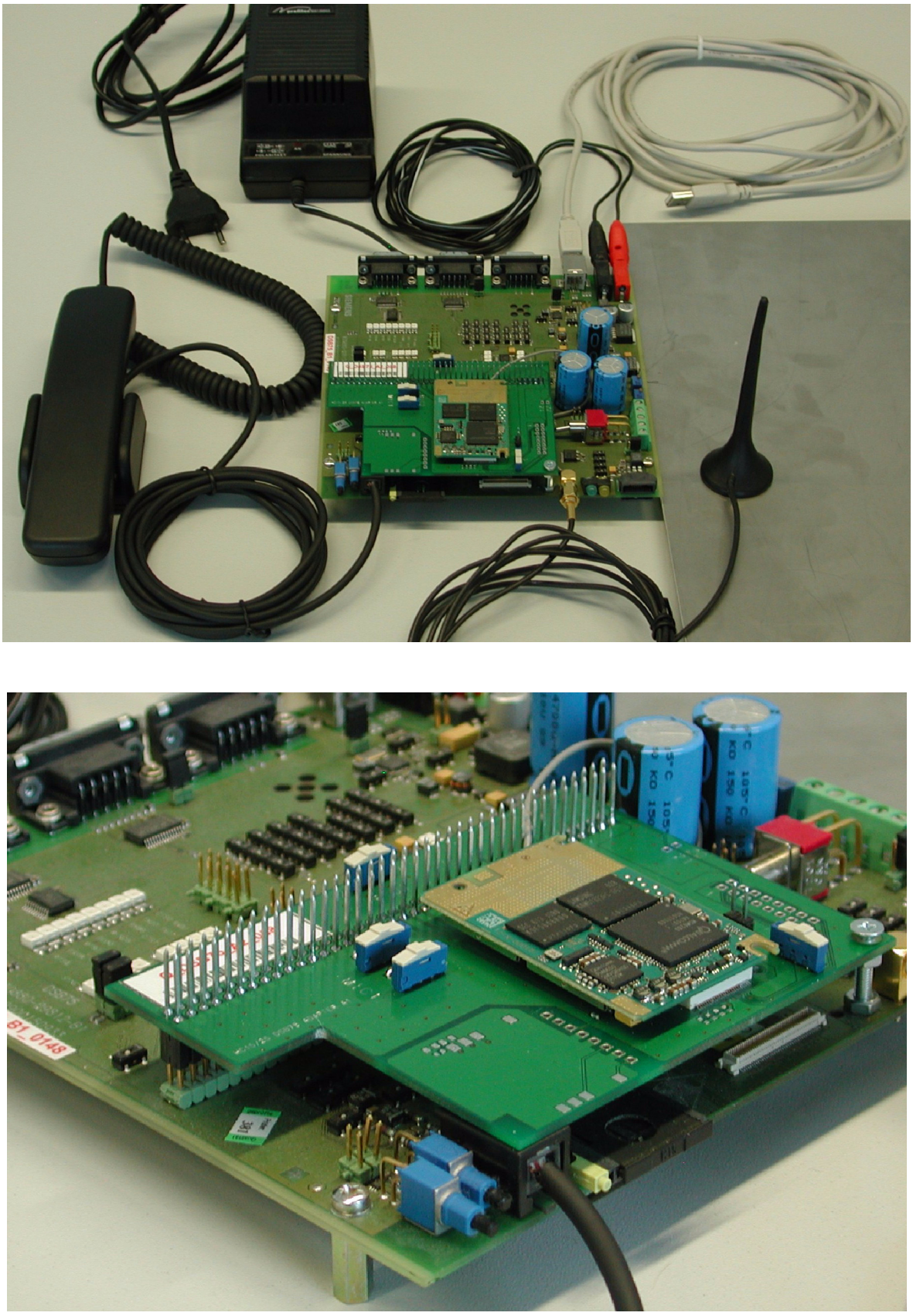
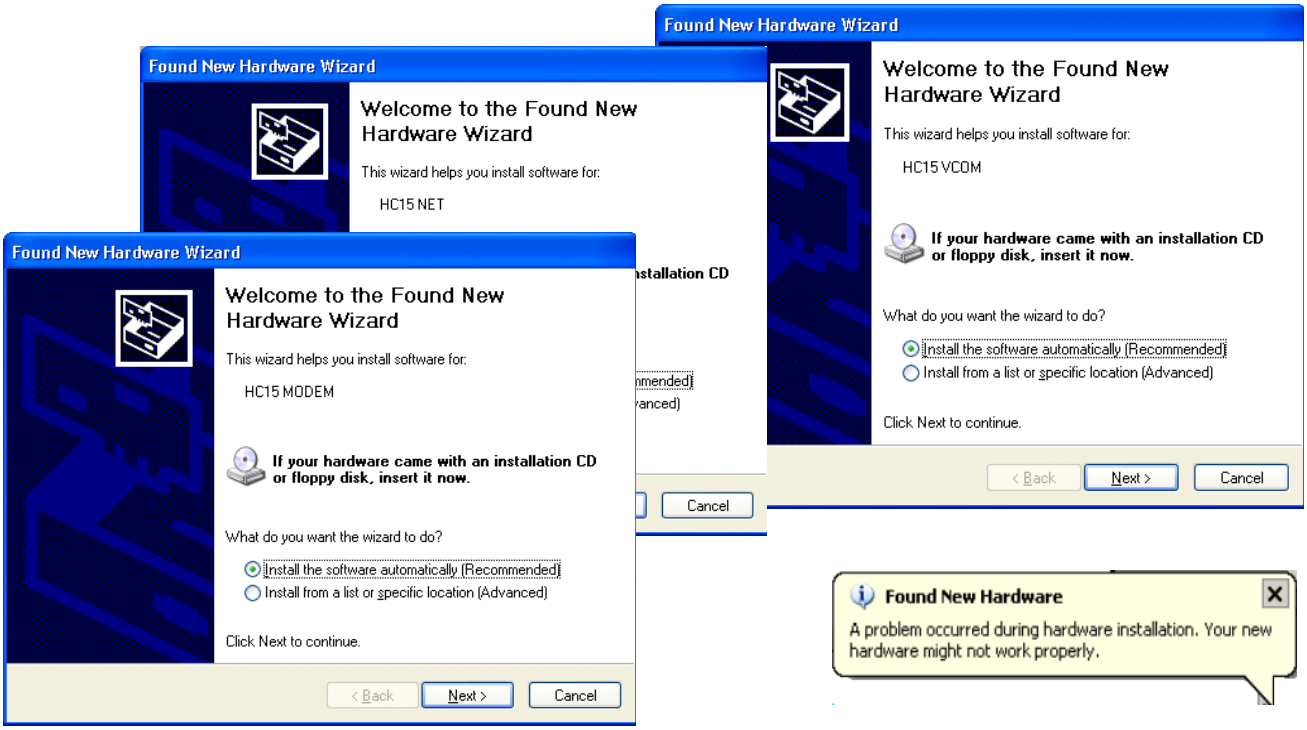


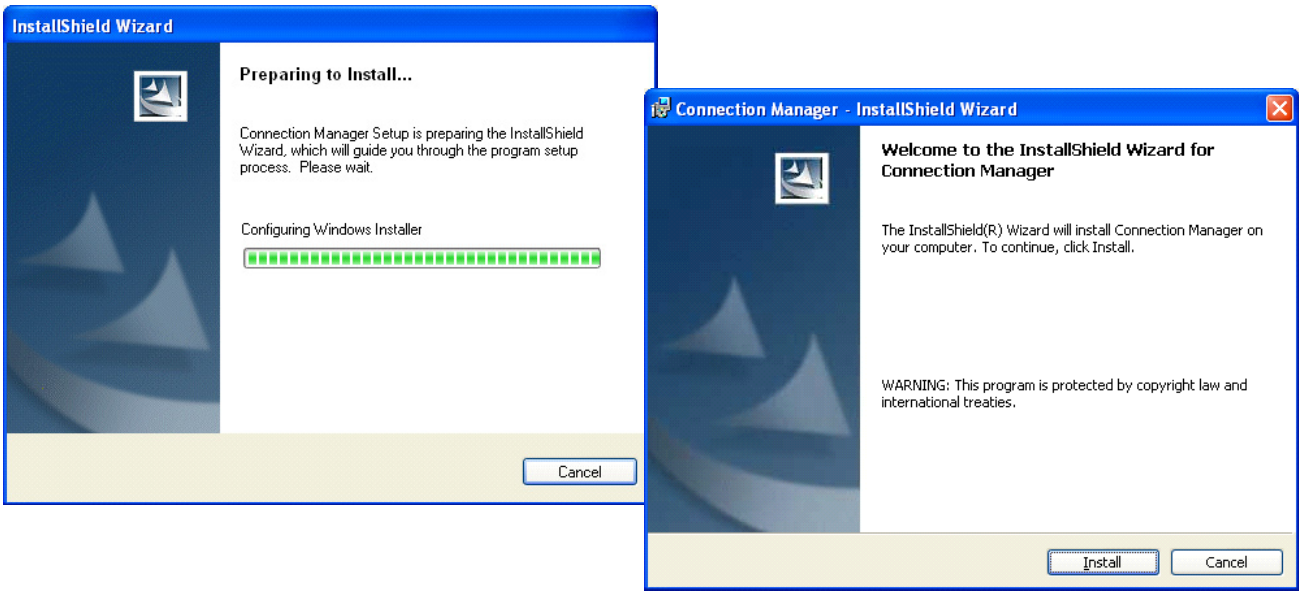
**Figure 2:** DSB75 with HC15 module and accessories connected

## 2.3 Installing Connection Manager and Preparing Driver Installation

After powerup, you will see the “New Hardware Found Wizard“ coming up three times. Click *Cancel* in each dialog.
At the same time the module appears as a mass storage device in your Windows XP system, showing up as a *Removable Disk* assigned to the next free drive in the Windows Explorer. The supplied HC15 driver software is available on this drive. An additional Windows system tray icon also indicates the mass storage device.

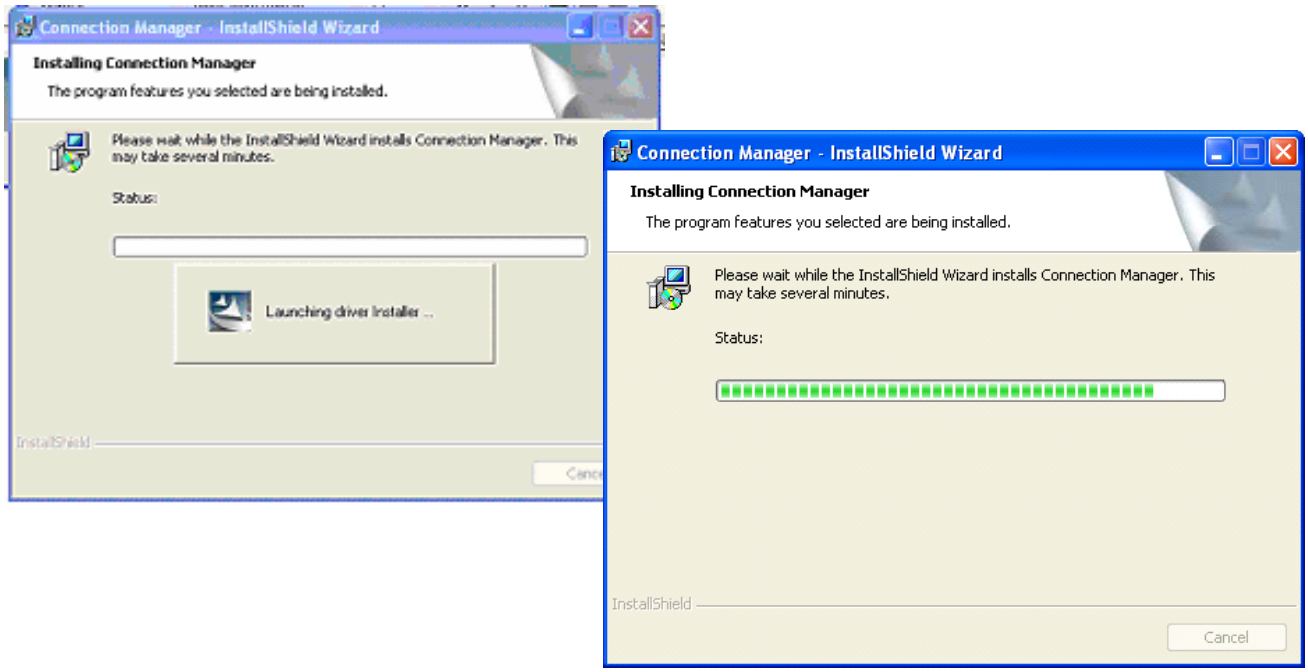

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
HC15 NET
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
HC15 MODEM
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
HC15 VCOM
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel
Found New Hardware
A problem occurred during hardware installation. Your new hardware might not work properly.

The wizard’s error message that pops up in the Windows taskbar shall be ignored. The installation will proceed automatically.
Note: If the installation fails to start automatically after you have canceled the three “New Hardware Found Wizards“ simply navigate to the mass storage drive (= Removable Disk in the Windows Explorer) and double-click the provided “autorun.exe“ file.


InstallShield Wizard
Preparing to Install...
Connection Manager Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Configuring Windows Installer
Cancel
Connection Manager - InstallShield Wizard
Welcome to the InstallShield Wizard for Connection Manager
The InstallShield(R) Wizard will install Connection Manager on your computer. To continue, click Install.
WARNING: This program is protected by copyright law and international treaties.
Install
Cancel

Please wait a brief moment, then press *Install* to start the installation of the Connection Manager.

The progress of the installation will be indicated as illustrated below. It is possible that there are up to 3 warning messages saying that the drivers are not digitally signed. Please ignore the messages and press *Continue anyway*.


Connection Manager - InstallShield Wizard
Installing Connection Manager
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs Connection Manager. This may take several minutes.
Status:
Launching driver installer ...
InstallShield
Cancel

Now the installation of the Connection Manager is completed, and the driver software is preinstalled. The last installation dialog closes automatically.

See Section 2.4 to continue.

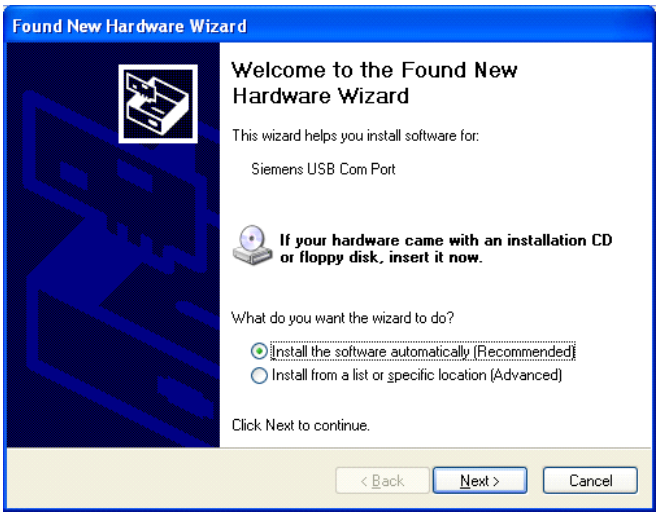
## 2.4 Installing USB and Ethernet Drivers

HC15 is installed as a composite device that comprises three virtual devices, one by one added to your Windows XP system:

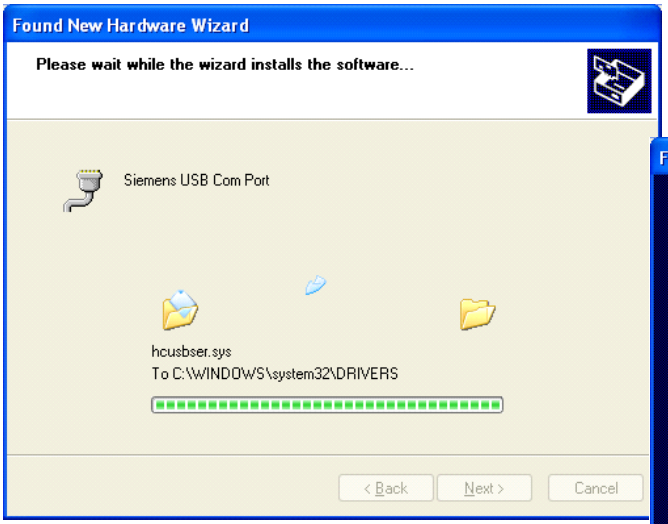
- Siemens USB Com Port driver
- Siemens Wireless Ethernet Adapter driver
- Siemens HSDPA USB Modem driver

During the installation, the HC15 USB interface will be assigned two virtual COM ports, one for the virtual modem port and one for the virtual application port. Windows will automatically allocate the next available COM port to each virtual interface.

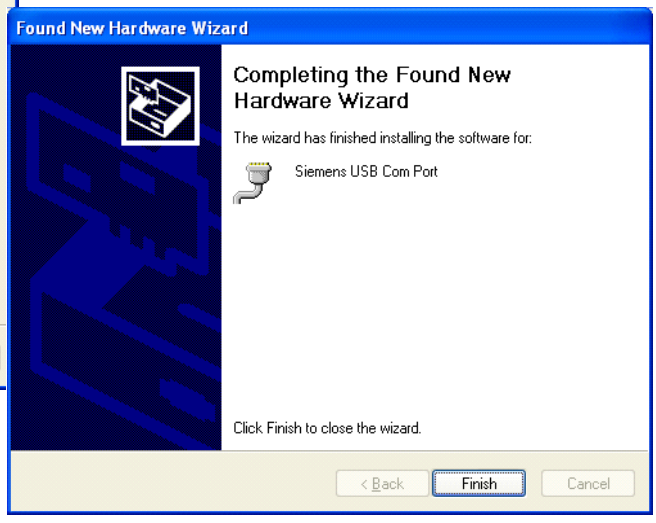
Once the Connection Manager installation has completed Windows detects the HC15 as a new USB composite device.


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Siemens USB Com Port
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

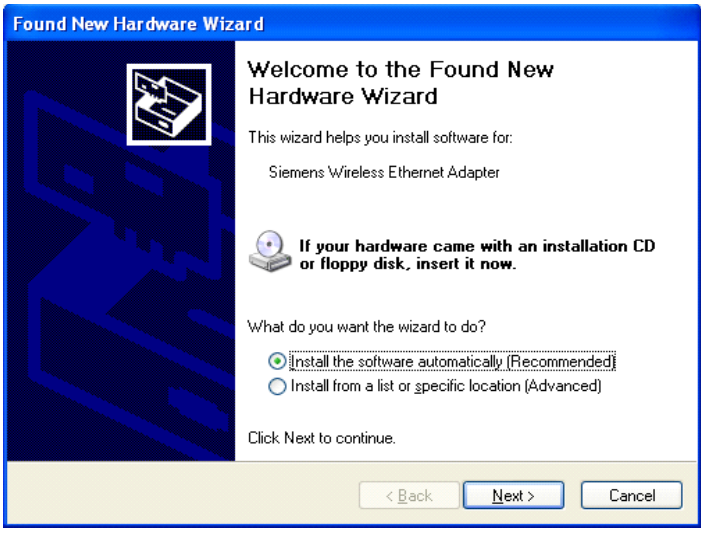
The *Found New Hardware Wizard* will start. Click *Next* to proceed with the installation of the "Siemens USB Com Port".



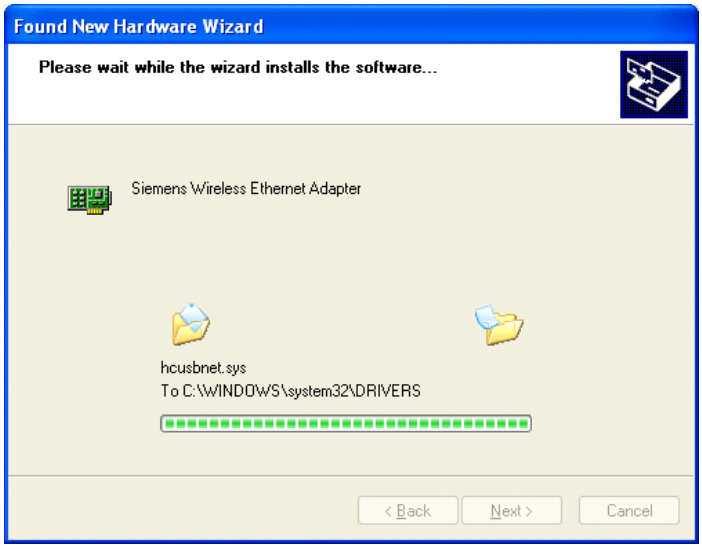

The progress of the driver installation is indicated.
It is possible that there are up to 3 warning messages saying that the drivers are not digitally signed. Please ignore the messages and press Continue anyway.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Siemens USB Com Port
Click Finish to close the wizard.
< Back
Finish
Cancel

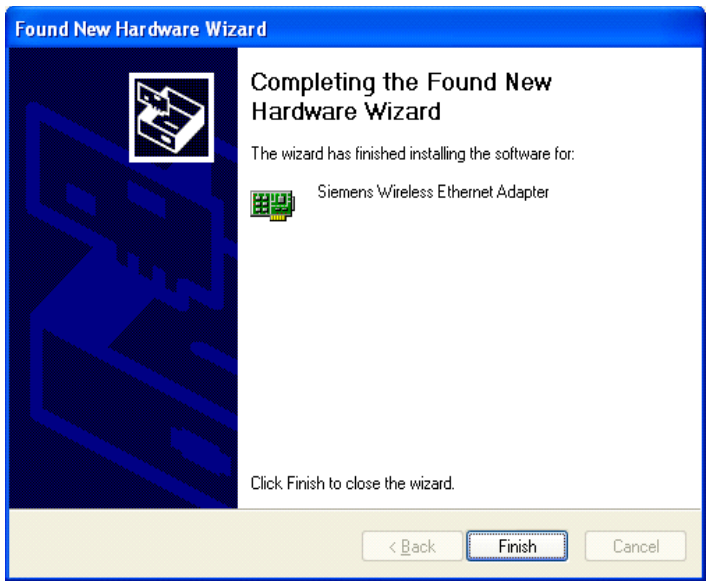
Click *Finish* to complete the installation of the "Siemens USB Com Port".


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Siemens Wireless Ethernet Adapter
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

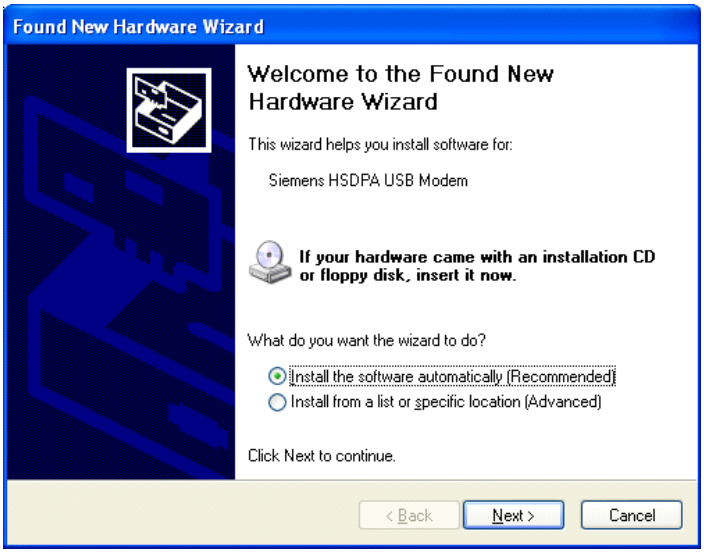
Now the installation of the "Siemens Wireless Ethernet Adapter" will start. Click *Next*.



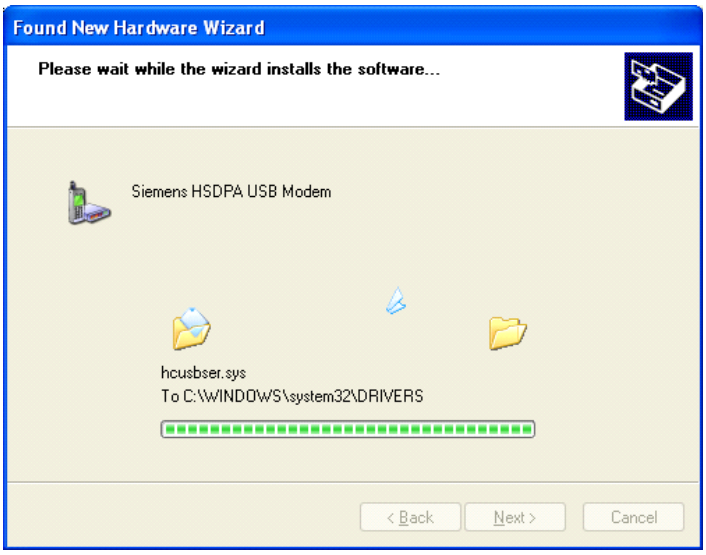

The progress of the driver installation is indicated. It is possible that there are up to 3 warning messages saying that the drivers are not digitally signed. Please ignore the messages and press *Continue anyway*.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Siemens Wireless Ethernet Adapter
Click Finish to close the wizard.
< Back
Finish
Cancel

Press *Finish* to complete the "Siemens Wireless Ethernet Adapter" installation.

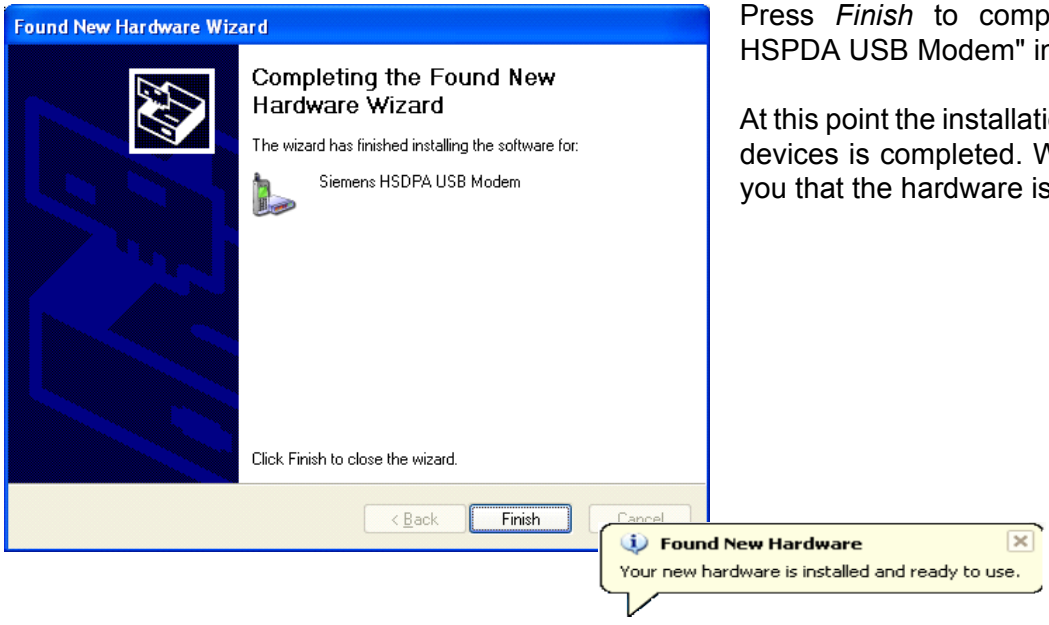

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Siemens HSDPA USB Modem
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Now the installation of the "Siemens HSDPA USB Modem" will start. Click *Next*.




The progress of the driver installation is indicated.

It is possible that there are up to 3 warning messages saying that the drivers are not digitally signed. Please ignore the messages and press *Continue anyway*.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Siemens HSDPA USB Modem
Click Finish to close the wizard.
< Back
Finish
Cancel
Found New Hardware
Your new hardware is installed and ready to use.

Press *Finish* to complete the "Siemens HSPDA USB Modem" installation.

At this point the installation of all three virtual devices is completed. Windows XP notifies you that the hardware is ready to use.

## 2.5 Special Installation Notes

If the installation does not work as expected, additional steps may be required, usually depending on the configuration of the Windows XP computer.

**HC15 does not show up as removable disk**

- If the HC15 is not visible as removable disk (mass storage device) when connected and switched on the first time, it is possible that the computer is configured to search the Internet for Windows updates. As a result, Windows is waiting for additional user action.
- To avoid this scenario, it is recommended to switch off this option before trying to install the HC15.

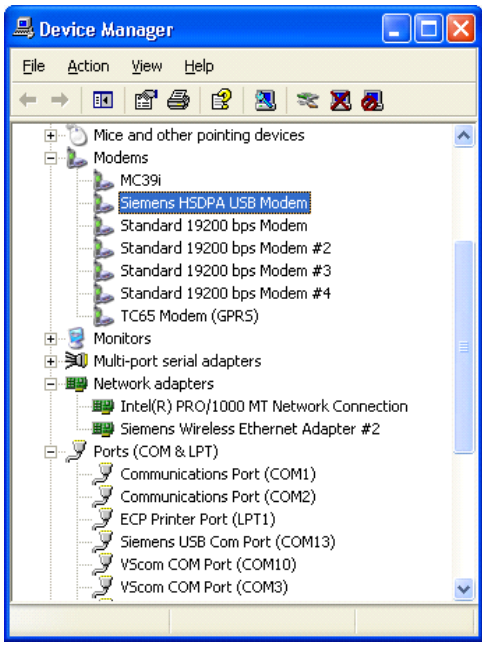
Connect to Windows Update
When you connect a new device, how do you want Windows to connect to the Windows Update Web site to search for a matching driver?
If my device needs a driver, go to Windows Update without asking me
Ask me to search Windows Update every time I connect a new device
Never search Windows Update for drivers
Using Windows Update requires a connection to the Internet.
Read our privacy policy
OK
Cancel

**Connection Manager installed, but driver installation does not start**

- If the Connection Manager installation completes successfully as explained in Section 2.3, but the driver installation does not start as shown in Section 2.4, it is possible that the HC15 has failed to change from mass storage device to composite device functionality.
- In this case, please stop the mass storage function manually. To do so, right-click the “Removable Disk“ drive and select *Eject*. The installation should proceed according to Section 2.4.
  If the HC15 still shows up as removable device, point to the associated Windows system tray icon, and select *Stop* from the resulting *Safely Remove Hardware* box. Then unplug and replug the USB cable.

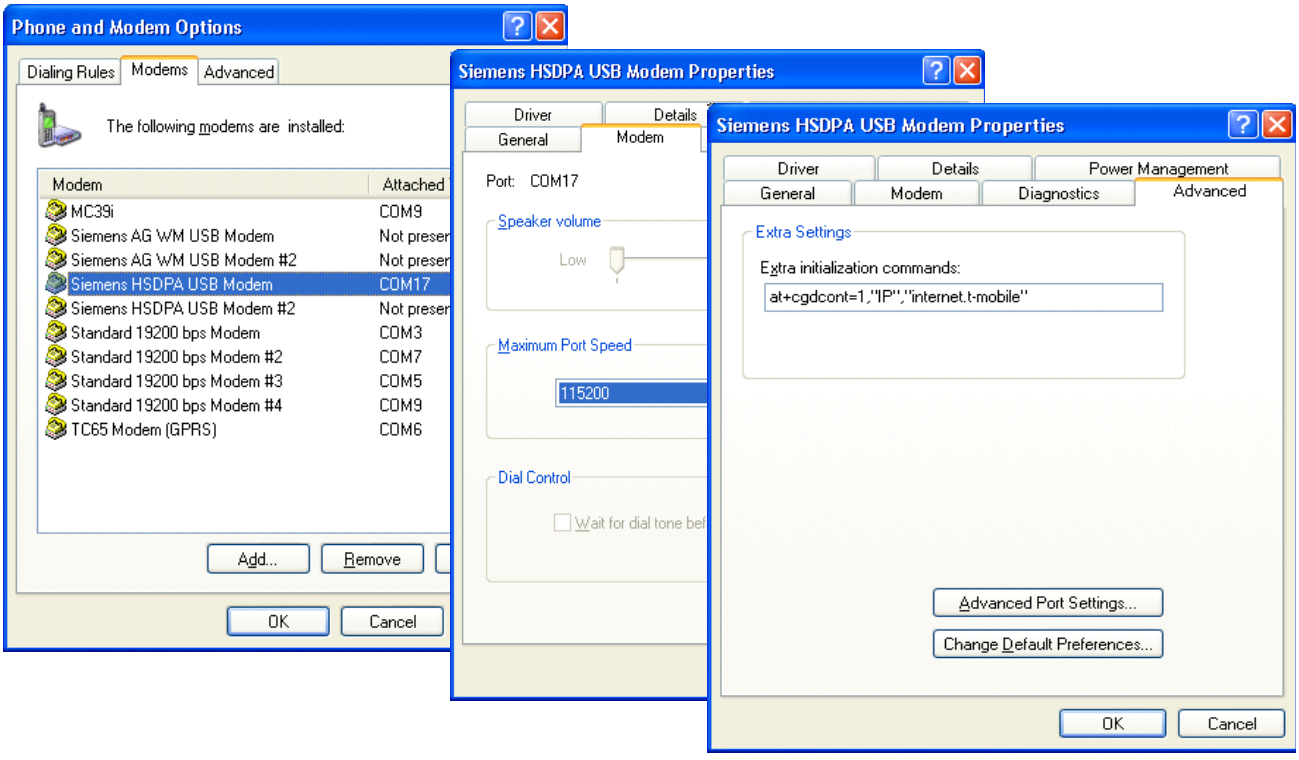
## 2.6 Installed Devices and Tools

After successful installation, the HC15 module is set up as composite device comprising the virtual devices listed below. Under Windows XP, you can use the *Device Manager* to check that all components are properly installed and configured.




**Siemens HSDPA USB Modem**

- AT command and data interface, also referred to as "Modem" interface if queried using the AT^SQPORT command.
- Intended particularly for HSDPA and GPRS data connections.
- The virtual COM port Windows has assigned to this interface is listed in the *Device Manager* under *Modems* and under *Control Panel* | *Phone and Modem Options*.
- The port number can be gathered from the property pages. This COM port can be used to set up dial-up network connections. The bit rate set by default on the modem property page is not relevant for USB and can be left unchanged. On the *Advanced tab* you can put the command string used to define the PDP context for your GPRS / HSDPA provider. See also Section 3.7.



**Siemens USB Com Port**

- AT command interface, also referred to as "Application" interface if queried using the AT^SQPORT command.
- Mainly intended for controlling the HC15 module, for receiving URCs, can be used also for sending, receiving, writing and reading short messages. Not intended as data interface for HSDPA and GPRS.
- The virtual COM port Windows has assigned to this port is listed in the *Device Manager* under *Ports (COM&LPT)*.

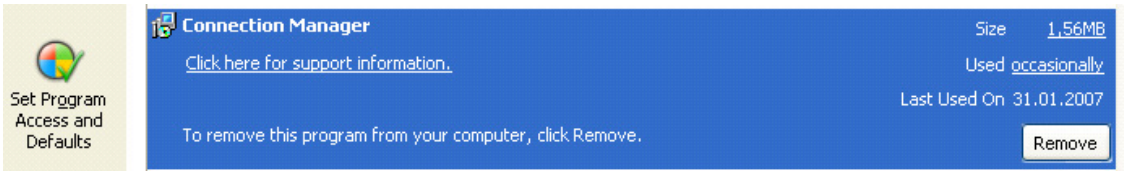
**Siemens Wireless Ethernet Adapter**

- Wireless network adapter intended for HSDPA and GPRS data connections.
- Listed in the Device Manager under Network adapters.
- Software controlled by the Siemens Connection Manager. To open the program in Windows XP, click *Start*, point to *Programs*, select *Siemens*, select *HSDPA USB Modem* and click *Connection Manager*. See Section 3.10 and Section 3.10.1 for details of how to set up a connection.

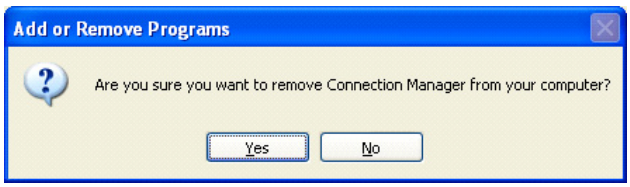
## 2.7 Uninstalling Drivers and Connection Manager

1. Ensure that the module is connected to the computer's USB port and switched on.

2. Select *Control Panel* | *Add or Remove Programs* and *Connection Manager*. Press *Remove* to select the uninstaller of the Connection Manager and the HC15 drivers.




3. Press *Yes* to start the uninstaller. The Connection Manager and all HC15 drivers will be removed.

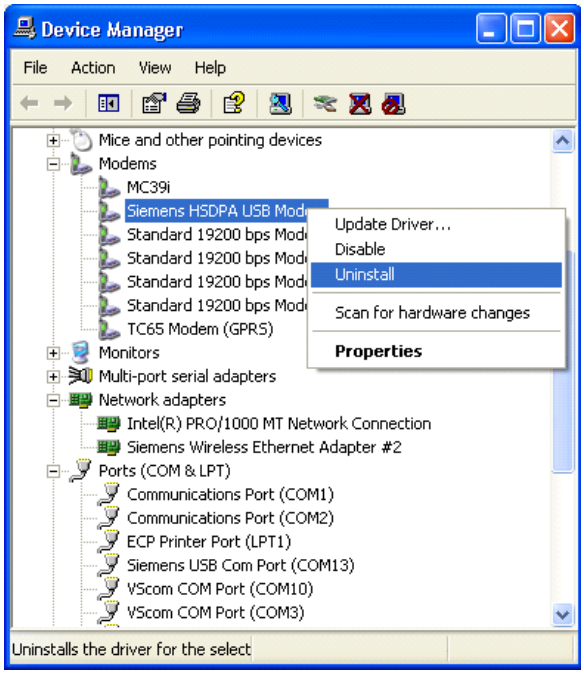


## 2.8 Uninstalling Drivers and Tools from Earlier HC15 Releases

The following procedures apply only to drivers of earlier HC15 releases supplied as preview samples for testing only.

### 2.8.1 Uninstalling Earlier Drivers

1. Under Windows XP, open the *Device Manager* and select the drivers as described in Section 2.6. Keep in mind that the drivers are listed in the *Device Manager* only when the module is switched on. Right-click the driver and, from the resulting menu, select *Uninstall*.




2. Under ..\WINDOWS\system32\drivers remove the two files “hcusbser.sys“ and “hcusbnet.sys“.
3. Under ..\WINDOWS\INF check for old “oem*.inf“ and “oem*.pnf“ files and remove all files related to earlier customer samples.
   To do so, open the currently installed “oem*.inf“ file(s) and compare the content with the “hcser.inf“ and “hcnet.inf“ supplied with the customer samples. All “oem*.inf“ and associated “oem*.pnf“ files based on information from old “hcser.inf“ and “hcnet.inf“ files must be removed.
   An easy way to compare the content of these files is checking the information given in the [Siemens] section, such as the two examples shown below:
   Examples:

```
[SIEMENS]
%hcwwan.DeviceDesc_hc1%    = hcwwan.ndi, USB\VID_0681&PID_003E&MI_01

[SIEMENS]
%hcwwan.DeviceDesc_hc1%    = hcwwan.ndi, USB\VID_05C6&PID_7001&MI_01
```

### 2.8.2 Uninstalling Earlier Connection Manager

Old versions of the Siemens Connection Manager were installed in Windows XP under *Program Files* | *Siemens* | *ConnectionManager*. To uninstall the program simply remove the "conman.exe" file.

Any shortcuts and icons must be deleted manually.

# 3 Using the HC15 Module

The following examples show the basic steps required to register to the network, to select UMTS mode or GSM mode and to attach to HSDPA or GPRS.

The examples are based on a UICC card provisioned by the German network operator T-Mobile. The used UICC card is capable of UMTS and GSM and enables the subscriber to switch back and forth between both networks.

## 3.1 AT Command Interpreter

AT commands can be entered on two interfaces of the HC15 module:
- Siemens HSDPA USB Com Port
- Siemens HSDPA USB Modem

Yet, we recommend that the Siemens HSDPA USB Com Port be used for controlling the HC15 module, eg. for entering AT commands and receiving URCs, while the Siemens HSDPA USB Modem is mainly intended for use as a modem. For greater detail refer to [2], especially sections "AT Command Interpreter" and "Unsolicited Result Code Presentation".

As described in Section 2.6, each interface is assigned a virtual COM port of its own, which enables accessing the interface from the host application or, accordingly, the . To easily identify both interfaces you can use the AT^SQPORT command:

| | |
|---|---|
| AT^SQPORT<br>Application<br><br>OK | On the AT command interface, the Siemens HSDPA USB Com Port is referred to as "Application". |
| AT^SQPORT<br>Modem<br><br>OK | On the AT command interface, the Siemens HSDPA USB Modem is referred to as "Modem". |

If you need to operate the HC15 from both interfaces at a time, bear in mind that both are handled by the same AT command interpreter. As a result, AT commands entered on both interfaces are not executed in parallel but sequentially, one after the other. So, an AT command issued on one interface will be buffered on this interface to be executed after the other interface has completed processing earlier AT command(s). The buffered command string is not echoed, but will be indicated when executed.

## 3.2 Switching on the HC15

The HC15 can be started by pressing the IGT key of the DSB75. Please wait approximately 2 seconds before using the module, for example before entering AT commands.

## 3.3 Switching off the HC15

To shut down the HC15 module, enter the AT^SMSO command. This enables the ME to save all data and perform an orderly shutdown.

| | |
|---|---|
| AT^SMSO<br>OK | The ME switches off. |

The HC15 module can also be switched off by using the IGT line as described in [2], Section AT^SCFG and in [1], Section "Configuring the IGT Line for Use as ON/OFF Switch")

## 3.4 Registering to the Network

Make sure to operate the HC15 always with the UICC card inserted in the DSB75 card reader and a valid SIM PIN entered. This is because most AT commands require SIM PIN authentication.
Write command: AT+CPIN=<pin>[, <new pin>]

| | |
|---|---|
| AT+CPIN?<br>+CPIN: SIM PIN<br>OK<br>AT+CPIN=“1234“<br>OK<br>AT+CPIN?<br>+CPIN: READY<br>OK | Entering the SIM PIN. |

## 3.5 Selecting UMTS or GSM

The GSM 07.07 operator selection command AT+COPS has been enhanced to enable the subscriber to select whether to use UMTS or GSM. You can quickly switch back and forth between both network types while the ME remains registered.

Write command: AT+COPS=<mode>[, <format>[, <oper>[, <act>]]]

The parameter <act> (access technology) can take the values listed below. The parameter is stored non-volatile.
0 GSM network
2 UMTS network

Note: By factory default, an automatic network selection mode is set which enables the ME to select either UMTS or GSM, depending on the network coverage. This automatic mode remains enabled until you explicitly set either UMTS or GSM using the <act> parameter of AT+COPS. Setting the <act> parameter forces the ME to select either UMTS only or accordingly, GSM only. If the specified network is not available, the network registration will be disabled. Setting <mode> to 0 without choosing a specific <act> enables the automatic selection mode once again.

| | | |
|---|---|---|
| AT+COPS? | | Querying the current network mode. |
| +COPS: 0,0,"T-Mobile D",2 | | The ME is registered to the German operator T-Mobile and uses UMTS. |
| OK | | |
| AT+COPS=0,,,0 | #(or AT+COPS=,,,0) | Selecting the GSM network. |
| OK | | |
| AT+COPS? | | Query the current network type. |
| +COPS: 0,0,"T-Mobile D",0 | | The response confirms that the ME has changed to the GSM network. |
| OK | | |
| AT+COPS=0,,,2 | #(or AT+COPS=,,,2) | Selecting the UMTS network. |
| OK | | |
| AT+COPS? | | |
| +COPS: 0,0,"T-Mobile D",2 | | |
| OK | | |
| AT+CPIN? | | There is no need to enter the SIM PIN again. |
| +CPIN: READY | | |
| OK | | |
| AT+COPS=0 | | Setting automatic network selection mode. |
| OK | | |

Furthermore, the command AT+COPS serves to query or specify several modes of selecting the GSM network operator. These functions are not discussed in this document.

## 3.6 Attaching to the HSDPA or GPRS Network

After PIN authentication, the HC15 module automatically tries to attach to the HSDPA or, accordingly, GPRS network.

| | |
|---|---|
| AT+CGATT?<br>+CGATT: 1<br><br>OK | Querying the current service state.<br>The ME is attached, depending on the selected network type (see AT+COPS), it is either attached to the HSDPA or GPRS service. |

## 3.7 Defining the PDP Context

Use the AT+CGDCONT command to configure the correct provider settings. The PDP context is stored non-volatile.

Write command:
AT+CGDCONT=<cid>[, <PDP_type>[, <APN>[, <PDP_addr>]]]

| | |
|---|---|
| AT+CGDCONT=1,"IP","internet.t-mobile"<br>OK<br><br>AT+CGDCONT?<br>+CGDCONT: 1,"IP","internet.t-mobile","",0,0<br>OK | Specifying the PDP context (example shows the APN of the German network provider T-Mobile).<br>Checking the current PDP context definition. |

The focus of this document is only on the parameters <cid>, <PDP_type> and <APN>. The string parameters must be enclosed in quotation marks.

Under Windows XP, the PDP context can, optionally, be entered on the *Modem* property page as described in Section 2.6.

## 3.8 Making a Voice Call (MO)

The commonly used GSM 07.07 dialing command ATD is fully applicable both in the UMTS and the GSM network.

To make a mobile originated voice call enter ATD, type the destination number and add a semicolon. The result code OK will be returned immediately after dialing, prior to call setup.

To end the call, use the AT+CHUP command (ATH is for data calls only).

| | |
|---|---|
| ATD030111111111; | The HC15 subscriber makes a voice call. |
| OK | |
| at+clcc | Checking the call status (MO call is active). |
| +CLCC: 1,0,0,0,0,"030111111111",129,"Tom" | |
| AT+CHUP | The HC15 subscriber terminates the call. |
| OK | |
| at+clcc | Checking the call status (no call). |
| OK | |

## 3.9 Answering a Voice Call (MT)

A mobile terminated voice call is indicated by the RING URC. To answer the call, enter ATA.

To terminate the call use AT+CHUP.

## 3.10 HSDPA or GPRS Data Transfer

HC15 offers two alternatives to access the GPRS or HSDPA networks:

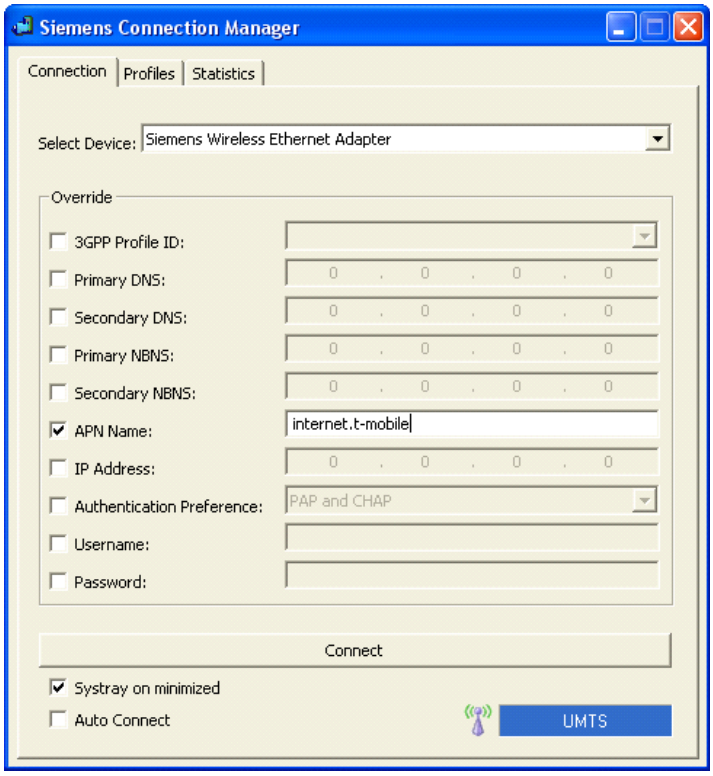
- The Siemens Connection Manager provided for the Siemens Wireless Ethernet Adapter. See Section 3.10.1.
- A dial-up network connection via the installed Siemens HSDPA USB Modem as described in Section 3.10.2.

In either case the ME must be registered to the network. So, before trying to connect to the data services ensure that SIM PIN authentication was done from the host application. To take advantage of HSDPA make sure that the <act> parameter of AT+COPS equals "2". For GPRS the parameter shall be "0". It is recommended to configure these settings on the Siemens HSDPA USB Com Port.

### 3.10.1 HSDPA or GPRS Data Transfer via Siemens Wireless Ethernet Adapter

The easiest way is using the Siemens Connection Manager installed along with the HC15 driver package.

- To open the tool in Windows XP, click *Start*, point to *Programs*, select *Siemens*, select *HSDPA USB Modem* and click *Connection Manager*.
- Use the *Select Device* listbox to choose the Siemens Wireless Ethernet Adapter. When opened the first time or after disabling the adapter, the listbox may be empty.
- Check the *APN Name* box and enter the APN (Access Point Name) of your service provider.
- If necessary, check the *Authentication Preference* box and select the type of authentication protocol. Otherwise, PAP and CHAP apply by default. Username and password are also provider dependent.
- Press the *Connect* button to set up a connection. Then simply open your Internet browser. The box on the rightmost bottom represents the signal strength.
- To close the connection press the *Disconnect* button (available when connected).

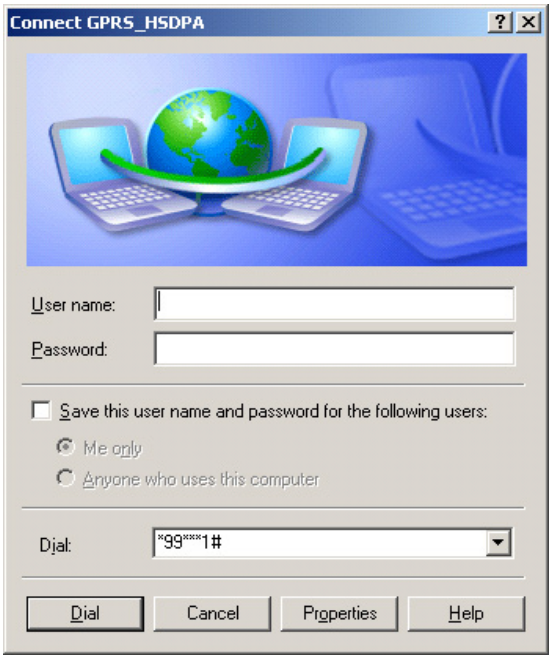



The *Auto Connect* check box on the leftmost bottom can be activated if you want the Siemens Wireless Ethernet Adapter to automatically connect to the network each time you restart the HC15. This option can be used particularly with a flat rate subscription. In this case, take care that the SIM PIN authentication is also done automatically.

## 3.10.2 HSDPA or GPRS Data Transfer via Dial-Up Network

Before dialing, make sure that the virtual COM port is not used by any application (eg. by a terminal program or by the host application).

Also, ensure that you have the PDP context for your service provider defined by using the AT+CGDCONT command. The command string can be entered either on the *Modem* property page on the Windows *Control Panel* or in the host application (see Section 2.6 and Section 3.7).

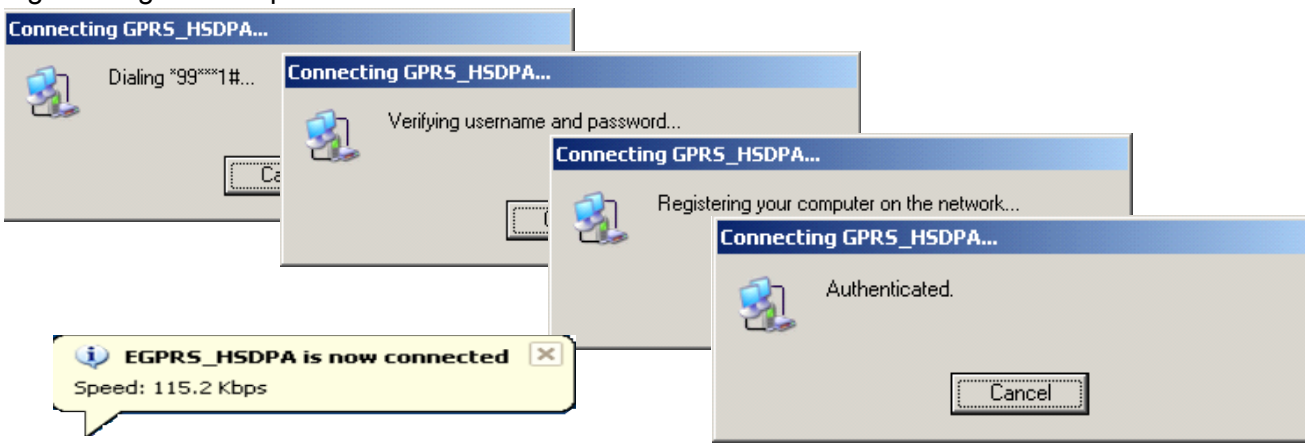



From the *Control Panel*, choose *Network Connections* and select the dial-up network connection created for HC15. (Instructions on how to create a new dial-up network connection can be found in Chapter 4.)

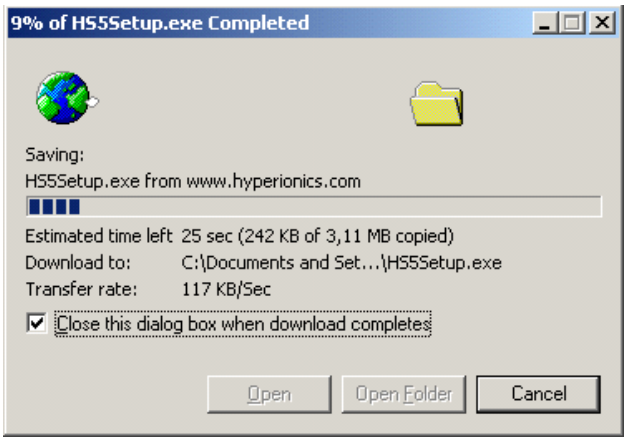
The correct dial string *99***1# should already be given, if entered in the Phone number box when the dial-up network connection was added. Otherwise, you can type the number here before dialing.

User name and password may or may not be required, depending on the network operator.

The connection is properly established when the following messages are reported:



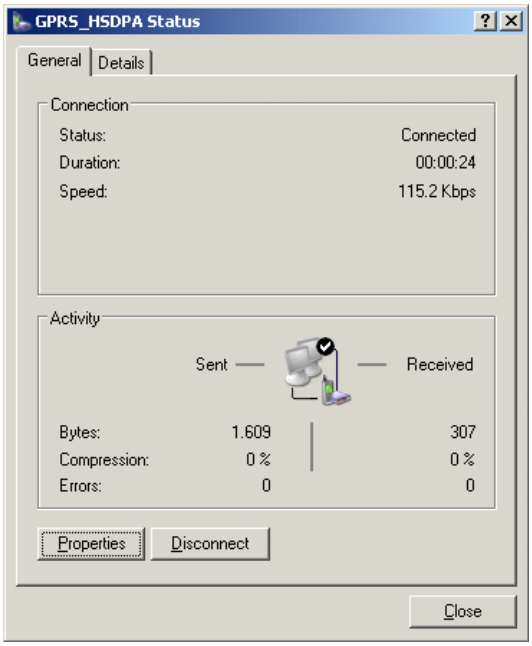

Note that the message showing “Speed 115.2 kbps“ can be ignored. It is only a Windows standard message for modems which is neither relevant for USB nor does it reflect the true data rate used on the air interface.
To verify the data rates for up- and/or downlink, you can use, for example, the file download status dialog of your Internet browser.



**Terminating the dial-up network connection**
To stop a HSDPA or GPRS data connection disconnect the dial-up network connection. This can be done in two ways:

1. Double-click the dial-up network connection icon in the system tray. In the resulting connection status dialog press the *Disconnect* button.

2. The other way is available on the Network Connections page of the Control Panel: Right-click the active connection to open a context menu where to choose *Disconnect*.




### 3.10.2.1 Local Echo Settings

Due to the initialization strings typically set by modems, a dial-up network connection may automatically change the local echo settings: Opening a dial-up network connection deactivates (ATE0) and activates (ATE1) the local echo. Releasing the dial-up network connection deactivates the echo once again (ATE0). As modem and application interface are controlled from the same AT command interpreter the change takes effect on both interfaces.

Therefore, after closing a dial-up network connection you are advised to wait a few seconds before entering an AT command on the Application interface. Otherwise, it is possible that the echo deactivation command ATE0 is still being executed on the modem interface while another AT command is already entered on the application interface. As a result, the AT command response expected on the application interface may appear incomplete.

Likewise, if you enter an AT command on the application interface in parallel to a dial-up network connection running on the modem interface at the time when the echo is deactivated take into account that the expected response may be indicated either partially or not at all.

Each time after closing a dial-up network connection you are advised to send the ATE1 command to enable the local echo again.

# 4 Appendix I

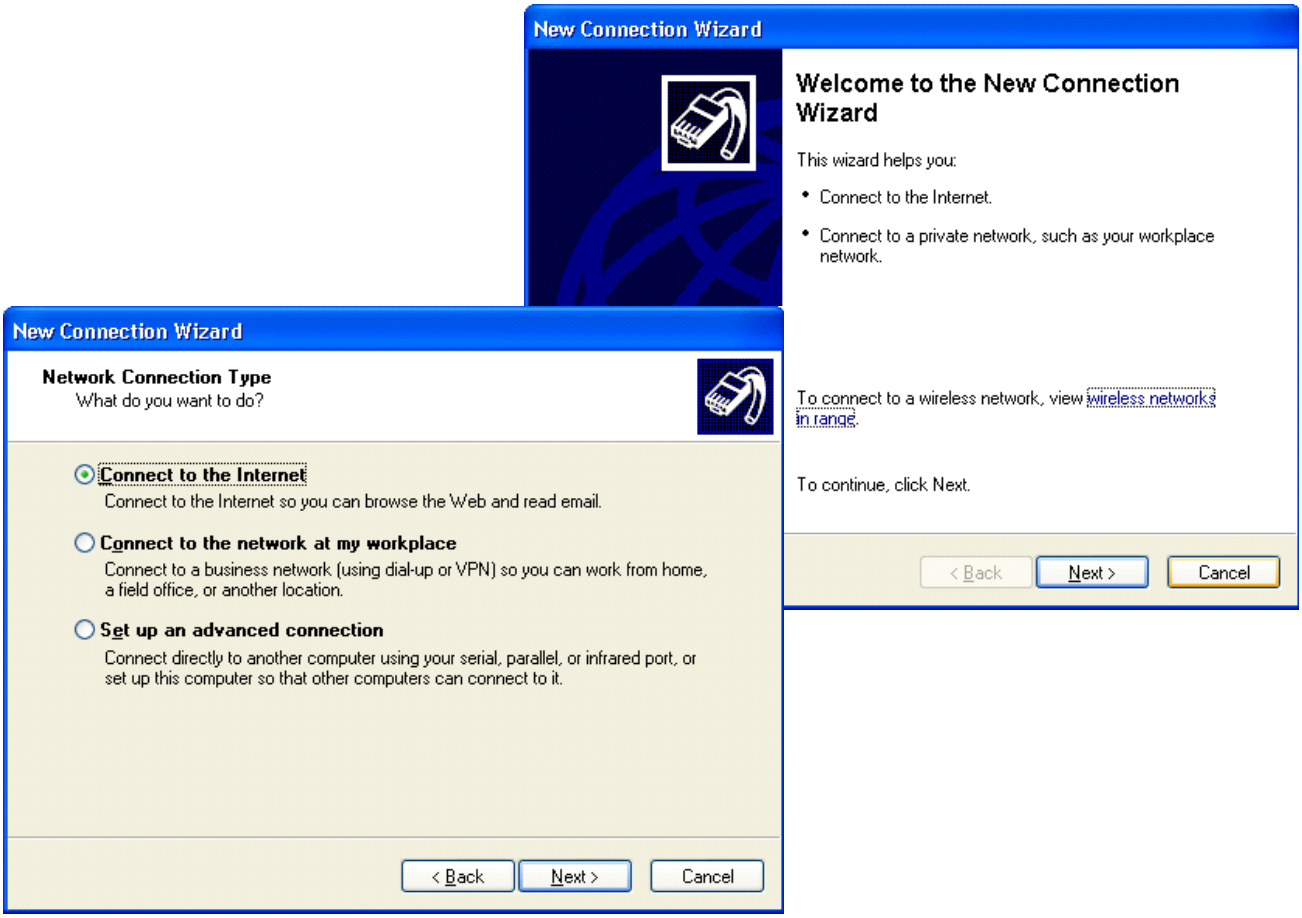
## 4.1 Adding and Configuring a New Dial-Up Connection

This section describes how to create and configure a new dial-up network connection when using the installed Siemens HSDPA USB Modem to access the GPRS or HSDPA network:

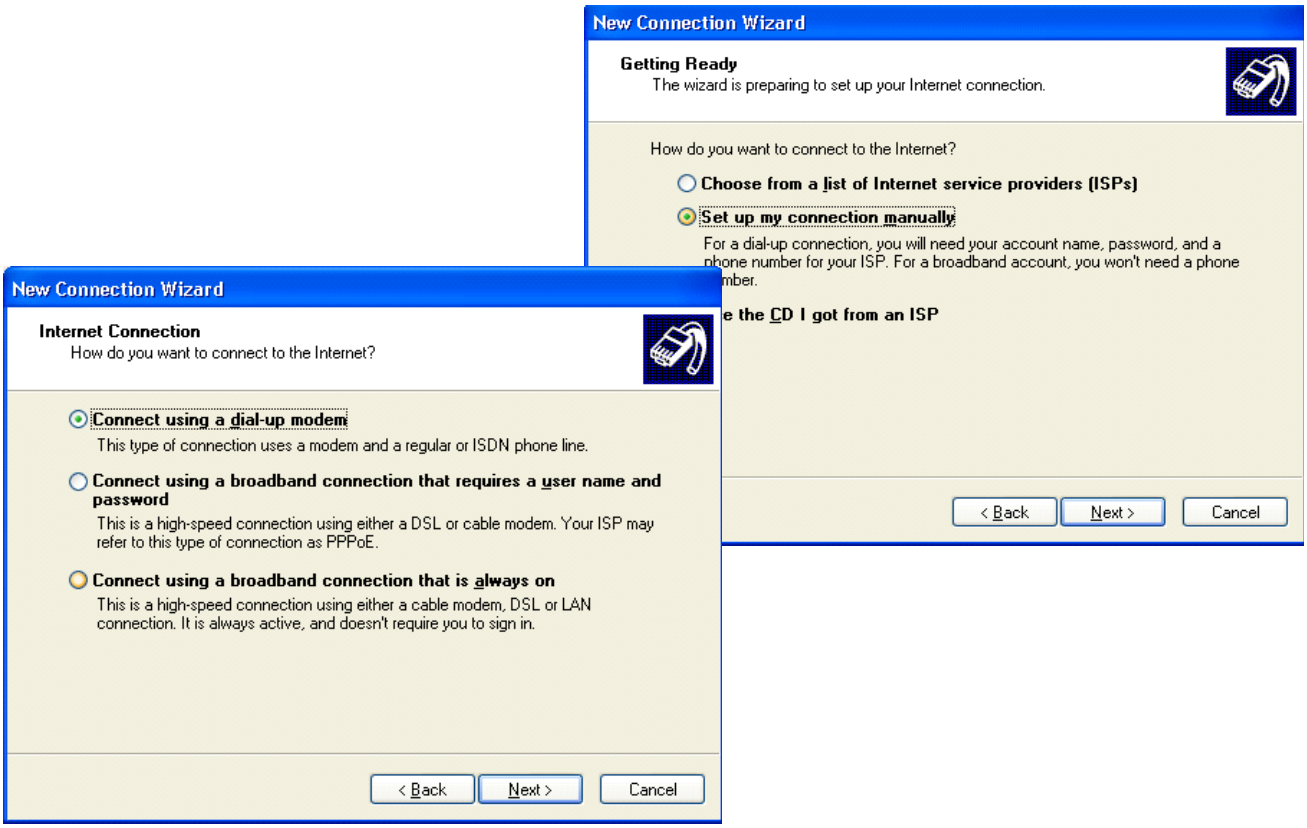
### 4.1.1 Creating a New Dial-up Network Connection

There are several ways to start creating a new dial-up network connection. For example, open the *Control Panel*, double-click *Network Connections*, select *New connection*. Another way is to select *Settings* from the *Start* menu, click *Network Connections*, then *New Connection Wizard*.

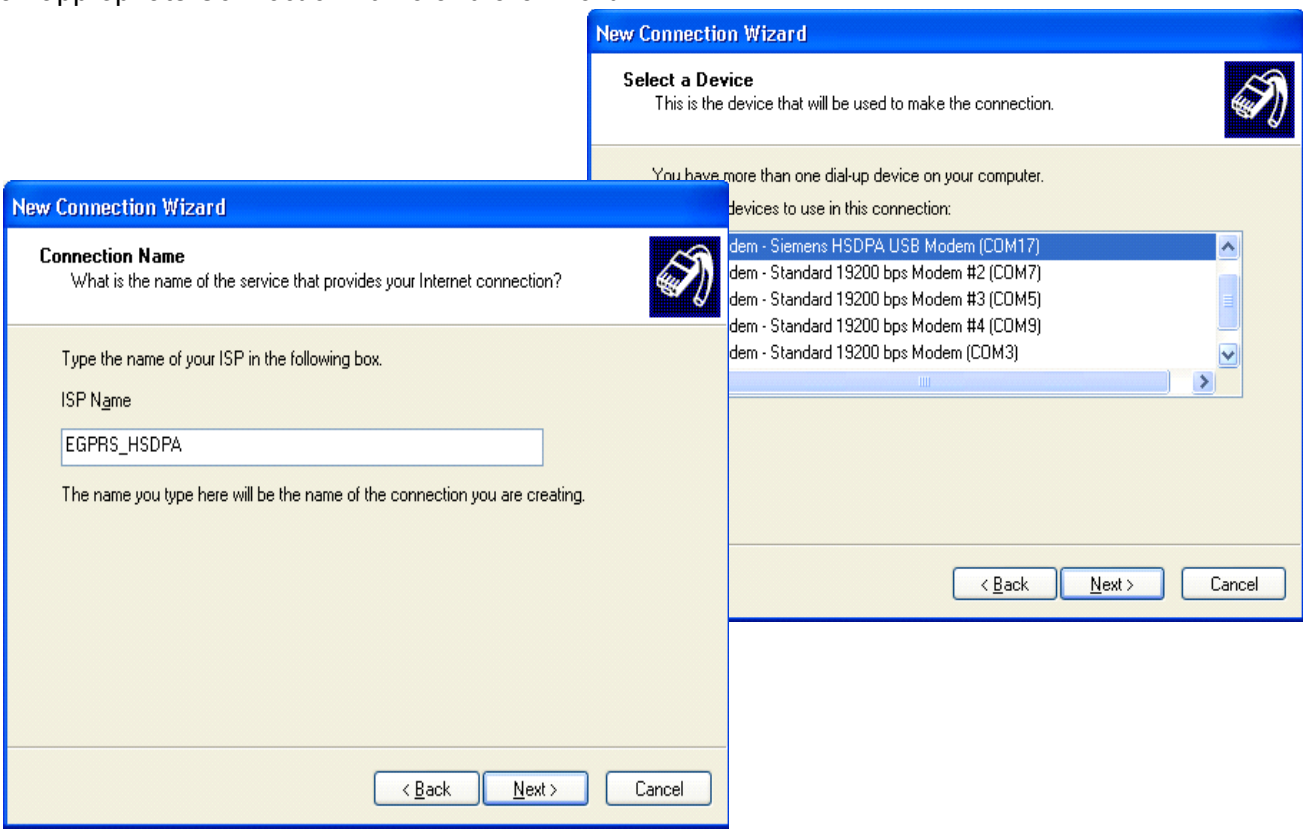
In any case, the *Network Connection Wizard* opens. Click *Next* to continue. Put a check mark on *Connect to the Internet* and click *Next*.


New Connection Wizard
Welcome to the New Connection Wizard
This wizard helps you:
Connect to the Internet.
Connect to a private network, such as your workplace network.
To connect to a wireless network, view wireless networks in range.
To continue, click Next.
< Back
Next >
Cancel
New Connection Wizard
Network Connection Type
What do you want to do?
Connect to the Internet
Connect to the Internet so you can browse the Web and read email.
Connect to the network at my workplace
Connect to a business network (using dial-up or VPN) so you can work from home, a field office, or another location.
Set up an advanced connection
Connect directly to another computer using your serial, parallel, or infrared port, or set up this computer so that other computers can connect to it.
< Back
Next >
Cancel

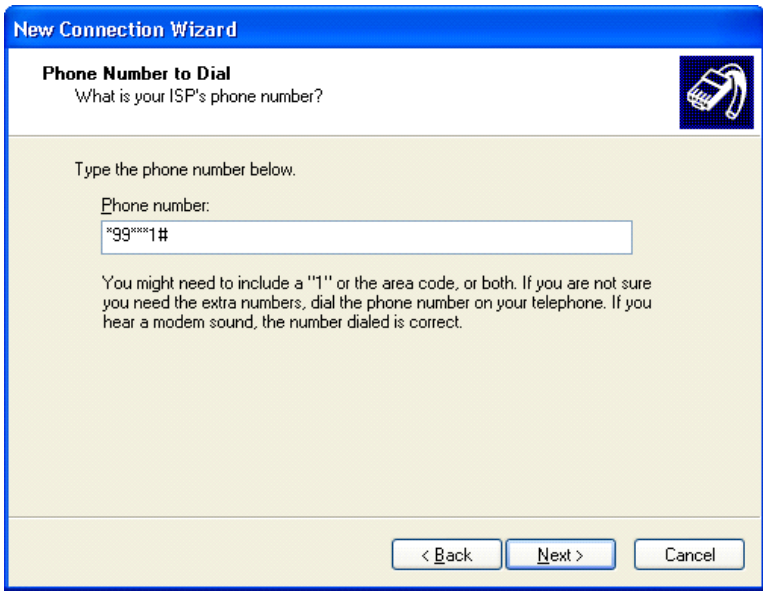
Select the option *Set up my connection manually* and click *Next*. Select *Connect using a dial-up modem* and click *Next*.


New Connection Wizard
Getting Ready
The wizard is preparing to set up your Internet connection.
How do you want to connect to the Internet?
Choose from a list of Internet service providers (ISPs)
Set up my connection manually
For a dial-up connection, you will need your account name, password, and a phone number for your ISP. For a broadband account, you won't need a phone
e the CD I got from an ISP
< Back
Next >
Cancel
New Connection Wizard
Internet Connection
How do you want to connect to the Internet?
Connect using a dial-up modem
This type of connection uses a modem and a regular or ISDN phone line.
Connect using a broadband connection that requires a user name and password
This is a high-speed connection using either a DSL or cable modem. Your ISP may refer to this type of connection as PPPoE.
Connect using a broadband connection that is always on
This is a high-speed connection using either a cable modem, DSL or LAN connection. It is always active, and doesn't require you to sign in.
< Back
Next >
Cancel

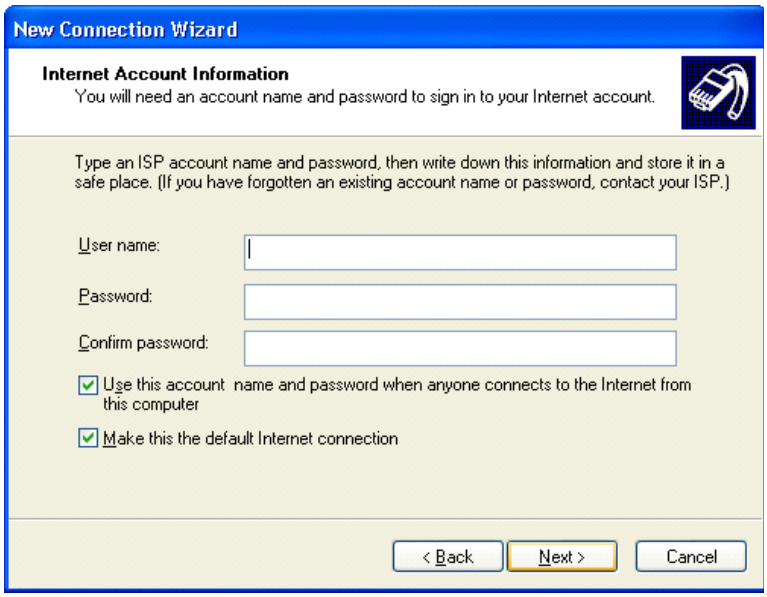
Select the modem that you want to use for the dial-up network connection. Click *Next* to continue. Type an appropriate *Connection name* and click *Next*.


New Connection Wizard
Select a Device
This is the device that will be used to make the connection.
You have more than one dial-up device on your computer.
devices to use in this connection:
dem - Siemens HSDPA USB Modem (COM17)
dem - Standard 19200 bps Modem #2 (COM7)
dem - Standard 19200 bps Modem #3 (COM5)
dem - Standard 19200 bps Modem #4 (COM9)
dem - Standard 19200 bps Modem (COM3)
< Back
Next >
Cancel
New Connection Wizard
Connection Name
What is the name of the service that provides your Internet connection?
Type the name of your ISP in the following box.
ISP Name
EGPRS_HSDPA
The name you type here will be the name of the connection you are creating.
< Back
Next >
Cancel

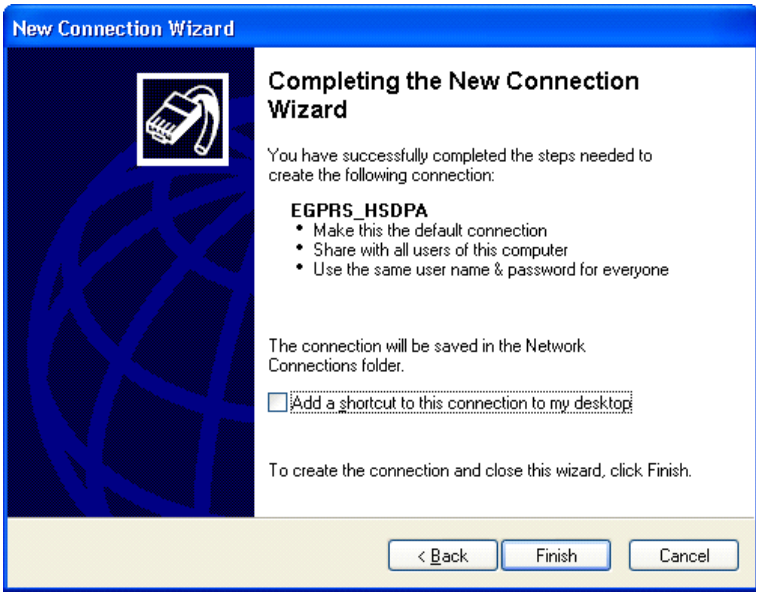
In the *Phone number* box, put the dial string *99***1# commonly used to access the GPRS network.
Note: The number "1" added before the hash determines that the first PDP context shall be used. The number must be identical to the <cid> value set with AT+CGDCONT (see Section 3.7).


New Connection Wizard
Phone Number to Dial
What is your ISP's phone number?
Type the phone number below.
Phone number:
*99***1#
You might need to include a "1" or the area code, or both. If you are not sure you need the extra numbers, dial the phone number on your telephone. If you hear a modem sound, the number dialed is correct.
< Back
Next >
Cancel

Depending on the network, you may be required to put a User name and a *Password* for the dial-up network connection. If not required, you may leave all boxes empty. Click *Next* and, in the resulting dialog, click *Finish*.


New Connection Wizard
Internet Account Information
You will need an account name and password to sign in to your Internet account.
Type an ISP account name and password, then write down this information and store it in a safe place. (If you have forgotten an existing account name or password, contact your ISP.)
User name:
Password:
Confirm password:
Use this account name and password when anyone connects to the Internet from this computer
Make this the default Internet connection
< Back
Next >
Cancel

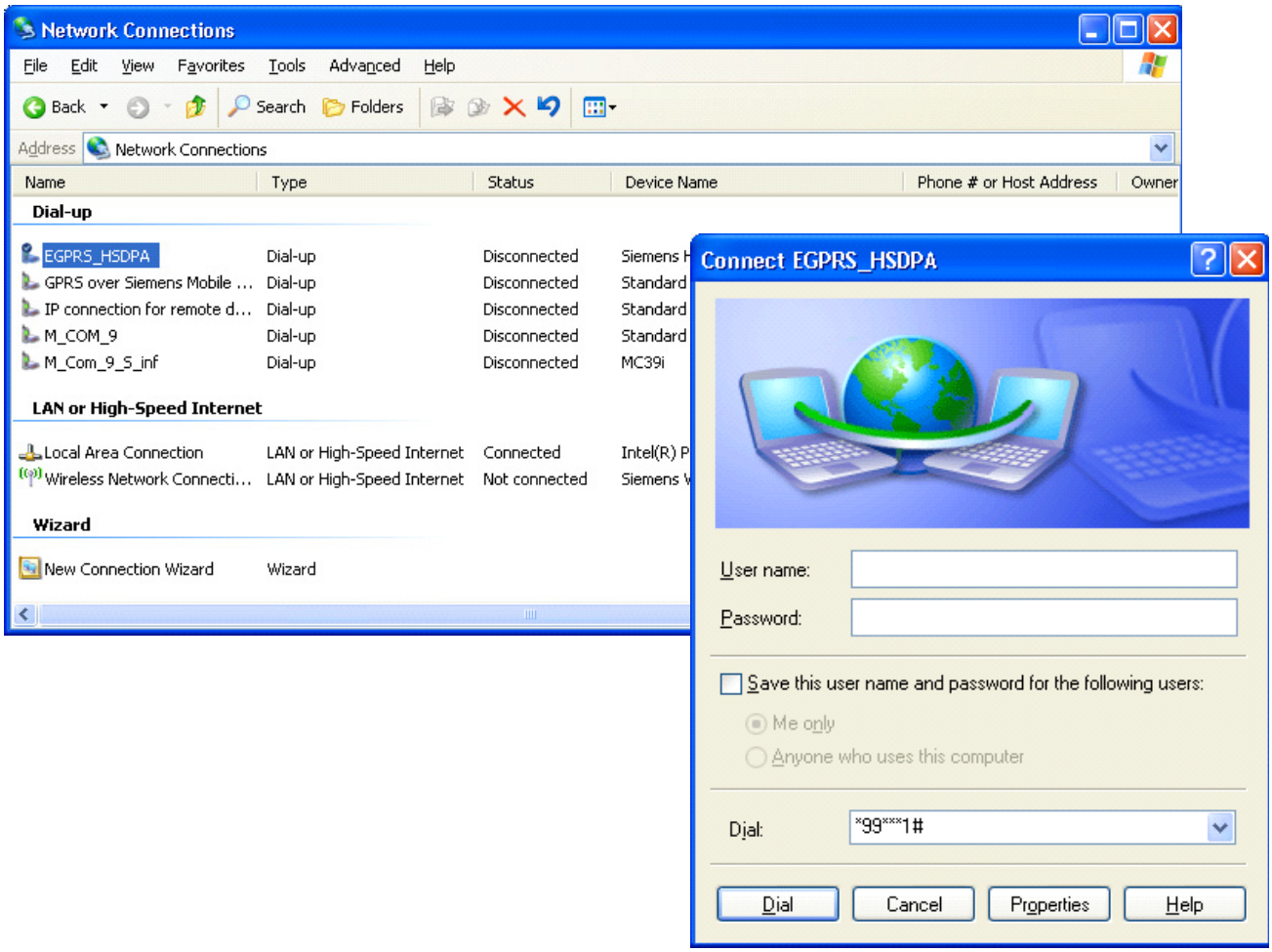
This will cause the *Connect…* dialog to appear (screen is shown in Section 4.1.2). Yet, at this moment, it is recommended that you press *Cancel* in order to check, and if necessary, to configure the dial-up network connection as described in Section 4.1.2.


New Connection Wizard
Completing the New Connection Wizard
You have successfully completed the steps needed to create the following connection:
EGPRS_HSDPA
Make this the default connection
Share with all users of this computer
Use the same user name & password for everyone
The connection will be saved in the Network Connections folder.
Add a shortcut to this connection to my desktop
To create the connection and close this wizard, click Finish.
< Back
Finish
Cancel

### 4.1.2 Configuring a Dial-up Network Connection

Every newly created dial-up network connection should be configured before using it to establish a PPP connection.

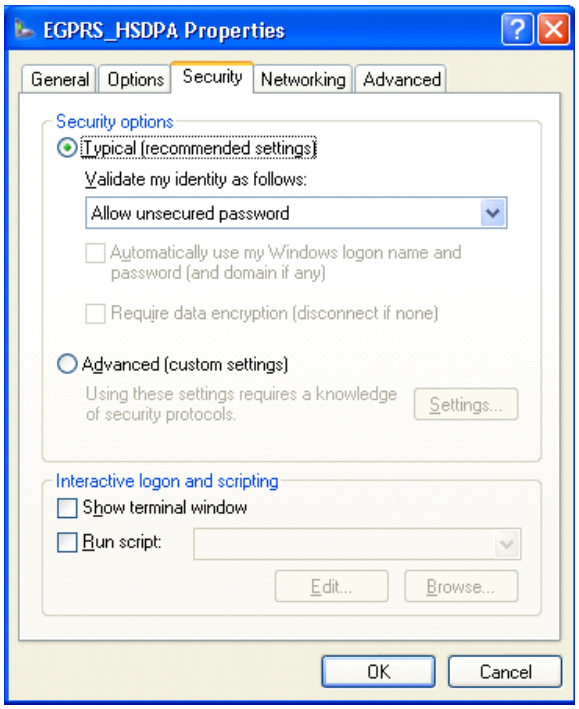
Open the *Control Panel*, double-click *Network Connections*, select the dial-up network connection you want to configure. In the resulting *Connect…* dialog, press the *Properties* button.



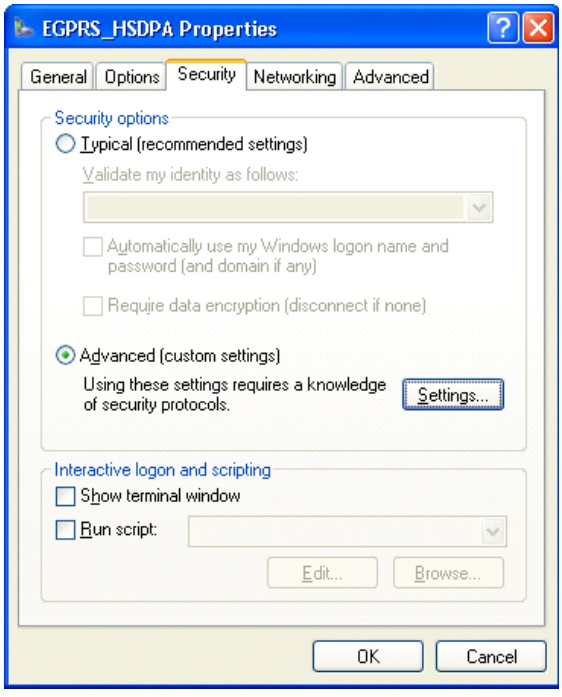

On the *General* tab, select the modem you want to configure. The correct dial string *99***1# should already be given, if entered before in the *Phone number* box when the dial-up network connection was created (see Section 4.1.1).

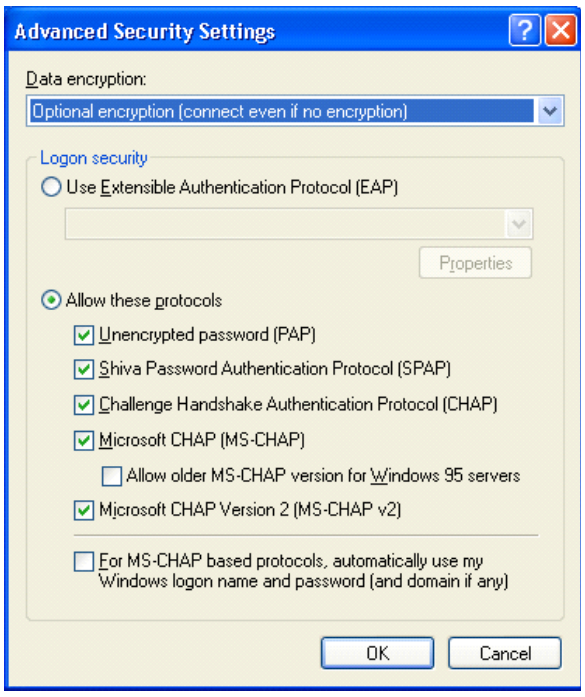
Select the *Security* tab to verify or edit authentication options for PPP connections.

By default, MS Windows XP enables the option *Typical* with unsecured passwords for the commonly used but unsafe PAP authentication method. As this is the minimum level of security supported in all networks the setting usually enables the subscriber to make a connection, though at the expense of security.



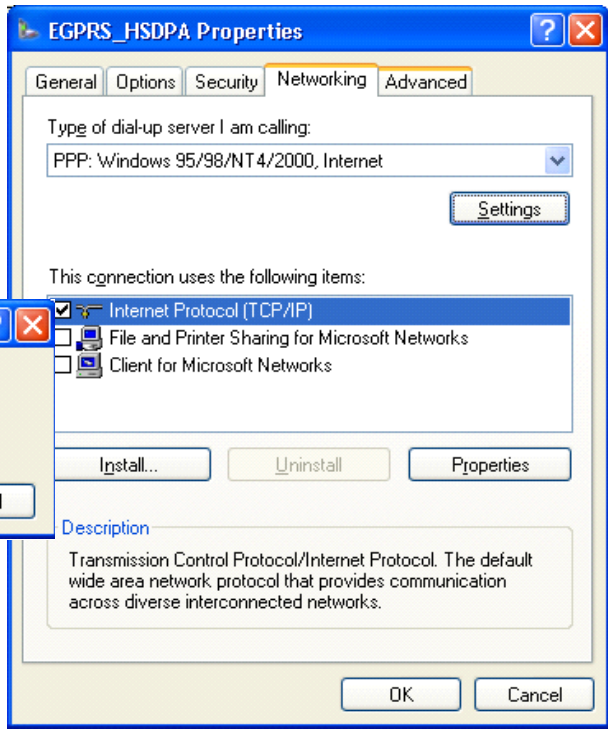

Many network operators apply more secure authentication methods for PPP connections, such as CHAP. For access to these networks, activate the *Advanced (custom setting)* option and press the *Settings* button. On the resulting *Advanced Security Settings* property page, enable / disable the authentication protocols according to the information provisioned by your service provider.

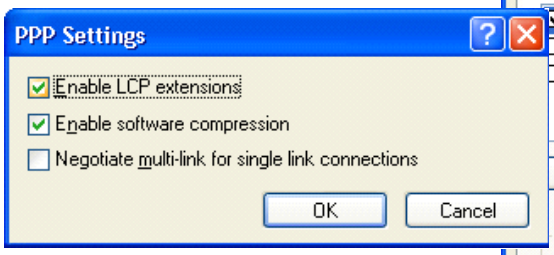




Advanced Security Settings
Data encryption:
Optional encryption (connect even if no encryption)
Logon security
Use Extensible Authentication Protocol (EAP)
Properties
Allow these protocols
Unencrypted password (PAP)
Shiva Password Authentication Protocol (SPAP)
Challenge Handshake Authentication Protocol (CHAP)
Microsoft CHAP (MS-CHAP)
Allow older MS-CHAP version for Windows 95 servers
Microsoft CHAP Version 2 (MS-CHAP v2)
For MS-CHAP based protocols, automatically use my Windows logon name and password (and domain if any)
OK
Cancel

Note: If an attempt to connect to a HSDPA or GPRS network fails, check that the authentication protocols are properly set.

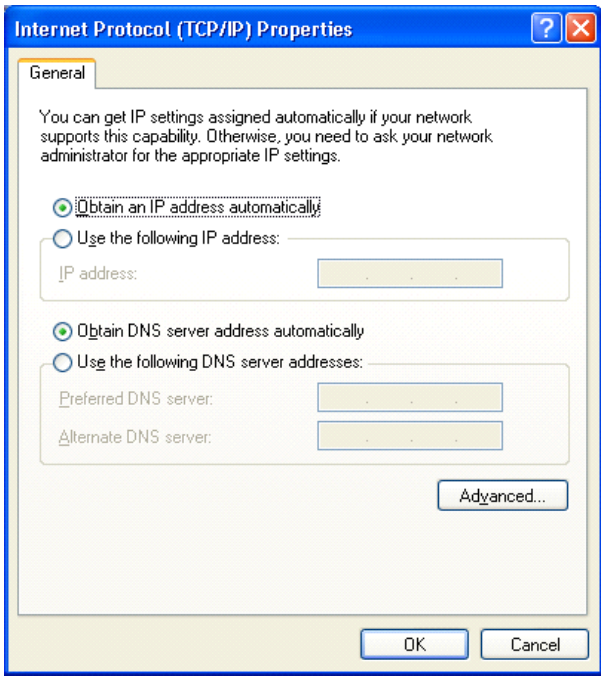
On the *Networking* tab, the default settings are acceptable in most cases: The drop-down menu shows *PPP: Windows 95/98/NT/2000, Internet* for the type of dialup server as default.

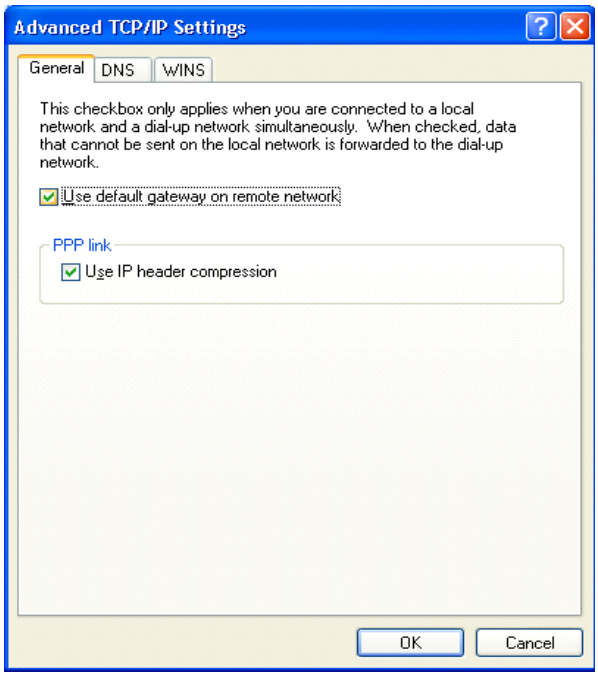



In the *PPP settings* box, verify that *Enable LCP extensions* and *Enable software compression* are selected and click *OK*.

Select the *Internet Protocol (TCP/IP)* on the *Networking* tab and press the *Properties* button to go to the *General* page. In most cases, it is sufficient to accept the default settings: *Obtain an IP address automatically and Obtain DNS server address automatically*.
Otherwise, you have to select the options *Use the following IP address / Use the following DNS addresses* and specify the IP addresses provisioned by your network operator.
The *Advanced* button opens a further property page where you can set your preferences when working in a local network and a dial-up network at the same time.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel


Advanced TCP/IP Settings
General
DNS
WINS
This checkbox only applies when you are connected to a local network and a dial-up network simultaneously. When checked, data that cannot be sent on the local network is forwarded to the dial-up network.
Use default gateway on remote network
PPP link
Use IP header compression
OK
Cancel

# 5 Appendix II

## 5.1 Configuring DSB75 Support Board and Adapter Board

This section refers to the DSB75 Support Board and the adapter board needed to mount a HC15 module onto the DSB75 Support Board.

The focus is on the configuration of several switches you may be required to change for use with HC15. A detailed description of the DSB75 Support Board is given in [4].

Please check that all slide switches (S100 - S103) on your HC15-DSB75 adapter board are set as shown in Figure 3.

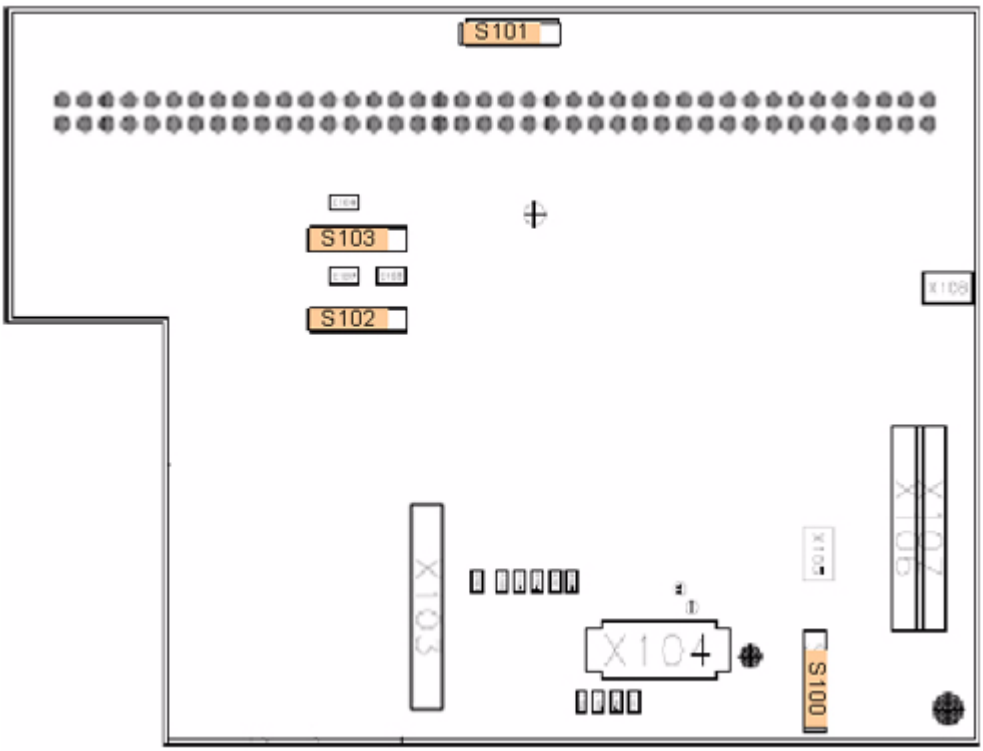



**Figure 3:** HC15-DSB75 adapter board - switch settings

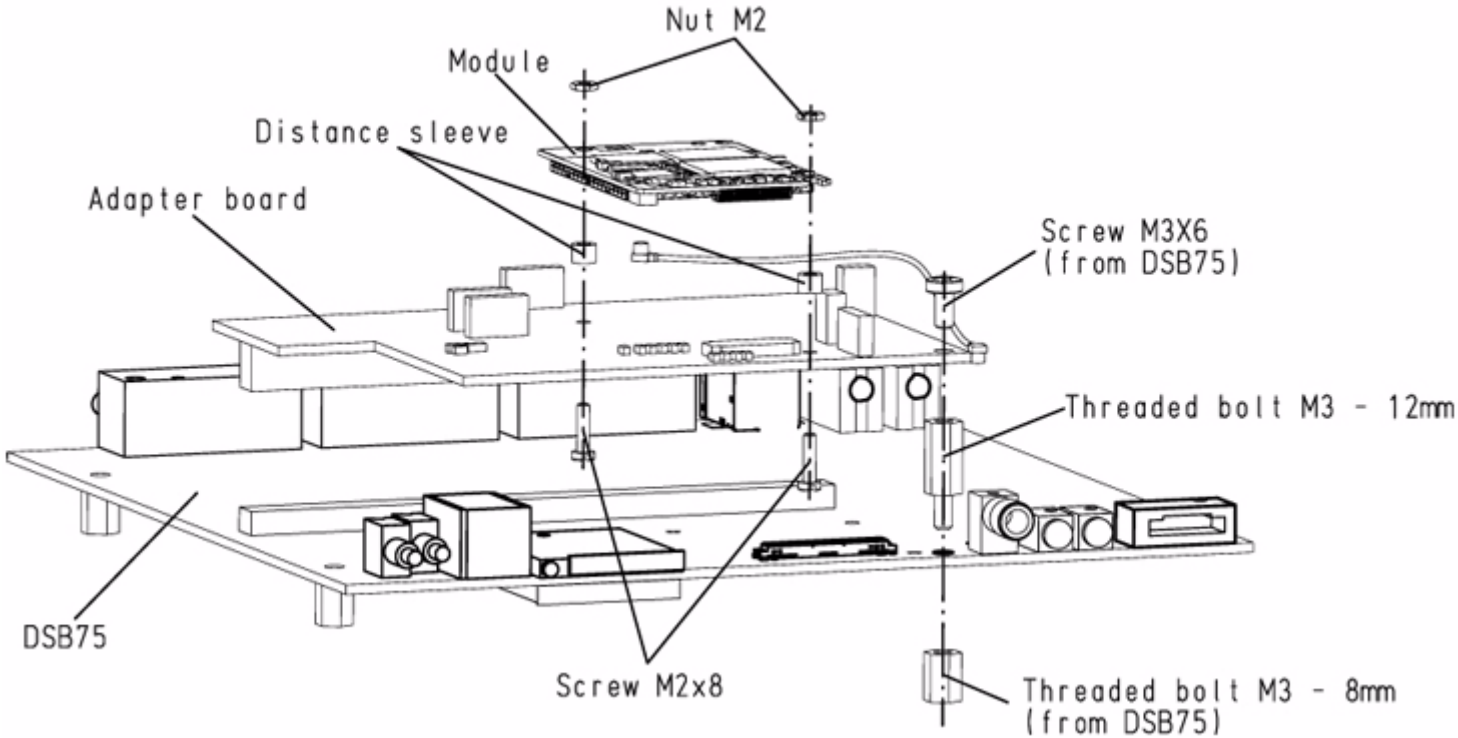


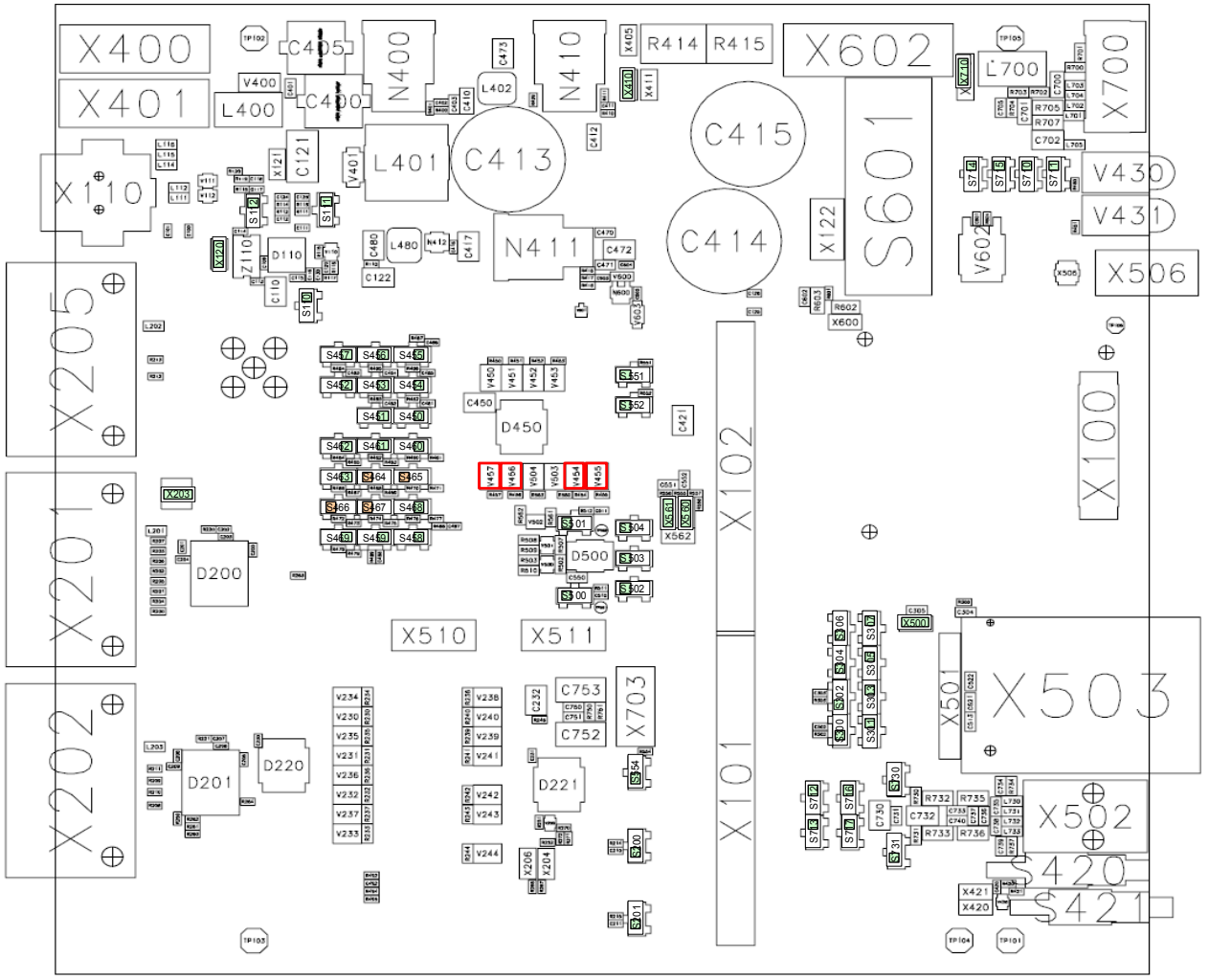

**Figure 4:** Mounting HC15 to DSB75 (exploded view )

X400 = power supply connector (red) for 9V - 15V
X401 =GND (black)

X110 = USB connector

X201, X202, X205: Do not use

X101, X102 = 80-pin header for adapter board




V430 = yellow LED (HC15 on)
V431 = green LED (DSB75 on)

X505 = Hirose U.FL
X506 = SMA connector

X100: Do not use

X503 = SIM card holder

X502 = Audio western jack

X420 = EMERG_OFF
X421 = IGT

**Figure 5:** DSB75 Support Board - switches, connectors, LEDs (overview)

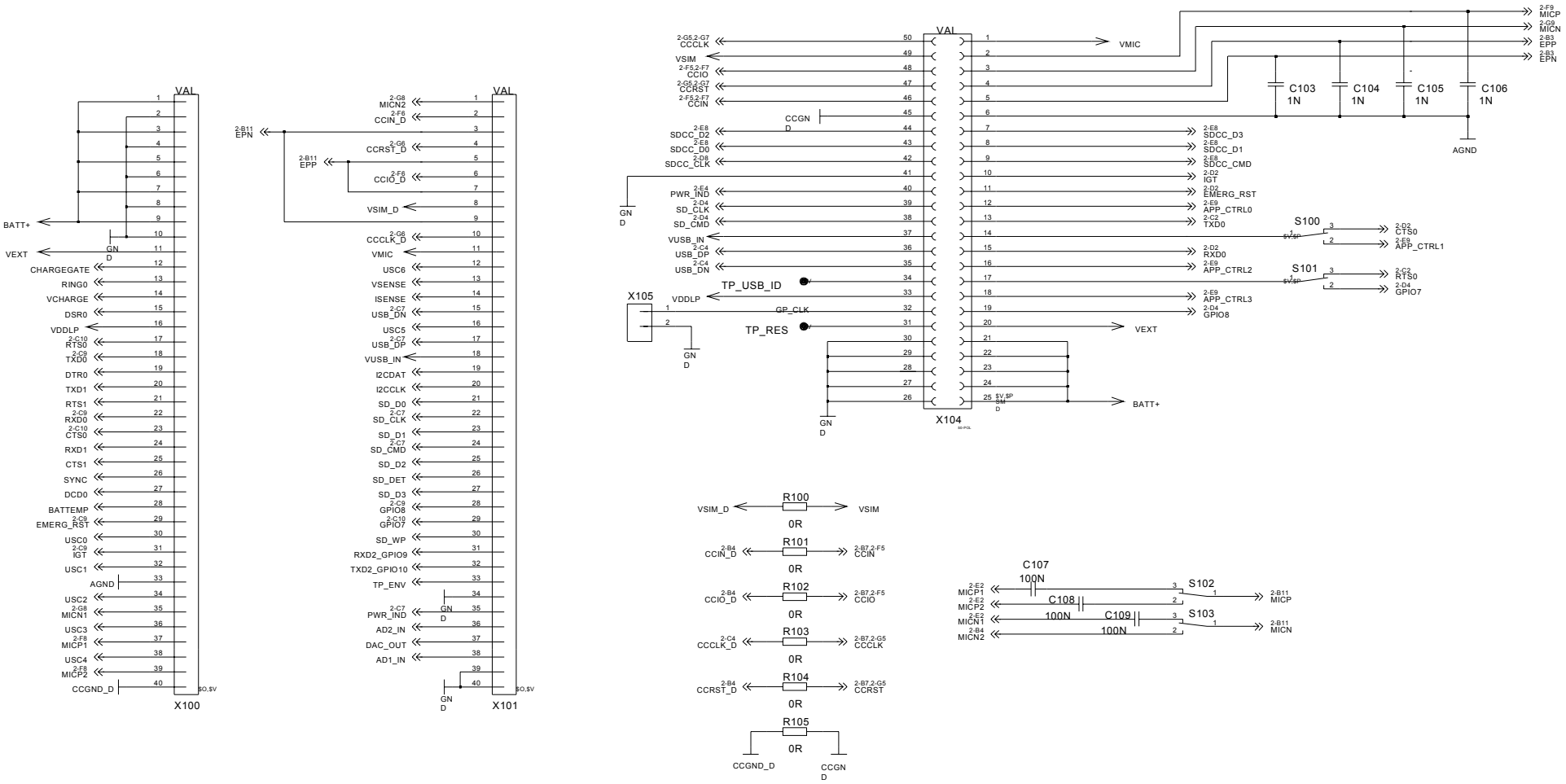



**Figure 6:** Adapter board schematic

# 6 Index

**A**
Adapter board for DSB75 ..... 7, 33
Antenna ..... 7
  Hirose U.FL ..... 7
  SMA ..... 7
APN ..... 6, 21, 23
Application interface ..... 16, 18
AT Command Interpreter ..... 18
ATD ..... 22
ATE ..... 25
AT+CGATT ..... 21
AT+CGDCONT ..... 21
AT+CHUP ..... 22
AT+COPS ..... 20
AT+CPIN ..... 19
AT^SMSO ..... 19
AT^SQPORT ..... 18

**D**
Dial-up network connection
  Configuring ..... 26
  Using ..... 23
DSB75 Support Board ..... 7, 32, 33

**H**
Hirose U.FL ..... 6, 7
HSDPA/GPRS data transfer
  Dial-up network connection ..... 23, 24, 25
  Siemens Connection Manager ..... 23

**I**
Installation
  Hardware ..... 7
  Siemens Connection Manager ..... 9, 10
  USB and Ethernet drivers ..... 11, 12, 13

**L**
Local echo ..... 18, 25

**M**
Mass storage device ..... 9, 14
Modem interface ..... 15, 18
Mounting
  Exploded view ..... 33
  Instructions ..... 7

**P**
PDP context ..... 15, 21, 24

**R**
Removable disk ..... 9, 14

**S**
Selecting access technology ..... 20
Selecting the network ..... 20
Siemens Connection Manager ..... 10, 23
Siemens HSDPA USB Com Port ..... 18
Siemens HSDPA USB Modem 11, 15, 18, 23
Siemens USB Com Port ..... 11, 16
Siemens Wireless Ethernet Adapter 11, 16, 23
SMARTEQ MiniMag antenna ..... 6

**T**
Technical requirements ..... 6

**U**
UICC ..... 6, 18
Uninstalling ..... 16, 17
Unsolicited Result Code Presentation ..... 18
URC ..... 18

**W**
Windows Device Manager ..... 15, 16, 17